MINISTRY OF COMMUNICATION, TRANSPORT, POST AND CONSTRUCTION

MAINSTREAMING APPROPRIATE LOCAL ROAD STANDARDS AND SPECIFICATIONS AND DEVELOPING A STRATEGY FOR THE MCTPC RESEARCH CAPACITY

PROGRESS REPORT 3
APRIL 2007

SEACAP 03

UNPUBLISHED PROJECT REPORT

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PROGRESS REPORT 3
April 2007

Prepared for: Project Record: **SEACAP 03. Mainstreaming Appropriate Local Road Standards and developing a Strategy for the MCTPC Research Capacity**

CONTENTS

ABBREVIATIONS & ACRONYMS

ACCESS	Microsoft database software
ADT	Average Daily Traffic
ASEAN	Association of South East Asian Nations
BRC	Bamboo Reinforced Concrete
CAFEO	Conference of ASEAN Federation of Engineering Organisations
CBR	California Bearing Ratio
CNCTP	Cambodia National Community of Transport Practitioners
CSA	Crushed Stone Aggregate
CSIR	Council for Scientific and Industrial Research (South Africa)
DBM	Dry Bound Macadam
DBST	Double Bituminous Surface Treatment
DCP	Dynamic Cone Penetrometer
DfID	Department for International Development
DoR	Department of Roads
EDCs	Economically emerging and Developing Countries
ENS	Engineered Natural Surface
esa	equivalent standard axles
EXCEL	Microsoft spreadsheet software
FHWA	Federal Highways Association (US)
FM	Fines Modulus
FWD	Falling Weight Deflectometer
GMSARN	Greater Mekong Sub-region Academic and Research Network
gTKP	global Transport Knowledge Partnership
HDM4	Highway Development and Management Model
HQ	Headquarters
IFG	International Focus Group
IFRTD	International Forum for Rural Transport Development
ILO	International Labour Organisation
IRF	International Road Federation
IRI	International Roughness Index
ITS	Indirect Tensile Strength
Km	kilometre
LCS	Low Cost Surfacing
LRD	Local Roads Division (DoR)
LVRR	Low Volume Rural Road
m	metre(s)

MCTPC	Ministry of Communication, Transport, Post and Construction
mm	Millimetre(s)
MERLIN	**M**achine for **E**valuating **R**oughness using **L**ow-cost **IN**strumentation
MPa	Mega pascals
MoU	Memorandum of Understanding
NUOL	National University of Laos
OM	Operations Manual
ORN	Overseas Road Note
PCU	Passenger Car Unit
Pen Mac	Penetration Macadam
PIARC	World Road Association
PTD	Planning and Technical Division (DoR)
QA	Quality Assurance
RED	Roads Economic Decision Model
Ref.	Reference
RRGAP	Rural Road Gravel Assessment Programme (Vietnam)
RRSR	Rural Road Surfacing Research (Vietnam)
RRST	Rural Road Surfacing Trials (Vietnam)
RTU	Rural Transport Unit
RT1	Rural Transport 1st Project, Vietnam
RT2	Rural Transport 2nd Project, Vietnam
RT3	Rural Transport 3rd Project, Vietnam
SBST	Single Bituminous Surface Treatment
SDC	Swiss Development Cooperation
SEACAP	South East Asia Community Access Programme
SIDA	Swedish International Developments Cooperation Agency
SOE	State Owned Enterprise
TRL	Transport Research Laboratory
UCS	Unconfined Compression Strength
UK	United Kingdom
UNOPS	United Nations Office for Project Services
VN	Vietnam
VOCs	Vehicle Operating Costs
VPD	Vehicles per day
WAN	Wide Area Network
WBM	Water Bound Macadam
WLC	Whole Life Costs

1 Introduction

1.1 General

The SEACAP 3 project is part of the wider South East Asia Community Access Programme (SEACAP), whose strategic theme is 'livelihoods of poor and vulnerable people in South East Asia improved sustainability'. SEACAP 3 will contribute to this overall objective through the development and mainstreaming of local resource-based standards for low volume rural roads. The project seeks to achieve three key outcomes:

- Mainstream appropriate local road standards and specifications into the national road programme,
- Develop an affordable and sustainable strategy for attaining the necessary road (all road categories) research capacity,
- Increase the awareness of good practice experience from this project by disseminating the outcomes at the national, sub-regional and international levels,

This report outlines the work undertaken on the SEACAP 3 project during April 2007; presents a summary of staff resources used and outlines the anticipated programme for the coming month.

1.2 Contractual Arrangements

The Agreements for the project to be undertaken was established under a Memorandum of Understanding (MoU) between the Ministry of Communication, Transport, Post and Construction (MCTPC) on behalf of the Government of Lao PDR and the Department for International Development (DfID), UK. The MoU defines The scope of the project, that it will be undertaken by TRL Limited as the Consultant and implemented under Terms of Reference, and that the Consultant will be appointed by DfID. The MoU also expresses certain Exemptions and Facilities to be provided by MCTPC to the Consultant to facilitate implementation of the project. The MoU was signed on the 16th of October 2006.

Thereafter, TRL provided a comprehensive technical proposal and a financial proposal for carrying out the project to DfID and subsequently entered into a contractual arrangement with DfID. TRL were appointed on 21st of November 2006. The duration of the project is 12 calendar months.

TRL is supported in its undertaking of the project by associate firms and by competent and experienced individual consultants. The principal associate firm is Lao Transport Engineering Consultants (LTEC) who are providing comprehensive local consulting services.

TRL have entered into a contractual agreement with LTEC to provide a total of 68 person months of services over the duration of the project. Forty-Four (44) person months are for engineering and translation services and 24 person months are for administrative, secretarial and coordination services.

The other associate firm is Intech Associates consulting engineers who have worked extensively with TRL on other SEACAP projects in the region. Intech will provide a short-tem specialist role on this project similar to that to be provided by the individual consultants.

2 Work Undertaken

2.1 General

The following sections summarise the work undertaken on SEACAP 3 during April 2007. During this month a number of meetings were attended with stakeholders; these are listed in Table.1. Progress on individual Modules is summarised in Table 2.

An assessment of progress during April should acknowledge the impact of the Lao New Year holiday, even though this had been taken partially into account in the initial programme.

2.2 Inception Report

The Inception Report was amended following comments from various stakeholders and a Final Version was submitted to SEACAP and the SEACAP Steering Committee.

2.3 Key Meetings

The first official SEACAP 3 progress meeting was held at the LRD offices on 11th April. A summary of meeting discussions is included as Appendix A to this report.

A briefing meeting was held with Peter O'Neill (DfID). Following an introduction to SEACAP 3, discussion centred on the importance of undertaking research to confirm or otherwise the suitability of sealing wearing course quality gravels and on providing Road design standards for all road classes. Sealing gravels roads is likely to be one important pavement option emanating from SEACAP 3 for which field research would be extremely beneficial and provision of a full range of standards is a necessity for MCTPC. Both of these topics are outside the scope of SEACAP 3.

During the meeting with DfID The SEACAP 3 team also received a briefing on SEACAP17, from Mike James of Roughton International and Vandy Vorasak of LTEC. Field trials using alternative road pavements and surfacings are being carried out under SEACAP 17. Construction is progressing satisfactorily. It was considered that some surfacing could be very suitable especially for short sections of rural road where the performance of gravel surfacing would be poor and expensive to maintain.

A further SEACAP briefing meeting for both DfID and Crown Agents was held in Phnom Penh, Cambodia at which progress on SEACAP 3 was discussed. The related short presentation is attached as Appendix B to this report

2.4 Task Group 1

The document and information review process continued with an emphasis on the collation of information into summary tables and the preparation of a review report. Information collection has been concerned largely with defining and grouping Lao road environments by identifying and collating information on construction materials; terrain; LVRR traffic and climate.

Information has also been collected on the experience of provincial contractors and their evaluation in road construction options. An extract from the capability listing is shown below.

Epuipment Capabilities			Key Personnel		General Experience	
Description	Model	Capacity	Position	Years Experience	Project Nam	Province
Phouheuang Road & Bridge Construction Company						
Hydraulic Excavator	PC220-5	220m3/hr	Director	8 Years	Municipality Road Maintenance	Phongsaly
Hydraulic Steel Drum Roller	SD100-D	6-9T	Deputy Director(Project Manager)	8 Years	Ban Yor - Pak Nam Noy Road	Phongsaly
Pneumatic Tire Roller		15T	Construction Manager	10 Years	Boun Neua - Phongsaly Road	Phongsaly
Water Tanker	CWM430-MHRT	3-4000L	Quality Control Manager	7 Years	Emergency Work Phongsaly-Boun Neua	Phongsaly
Bitumen Distributor	CWM430-MHRT	3-4000L	Administration Manager	16 Years	Phongsaly - Hatsa Road	Phongsaly
Chip Spreader	CWM430-MHRT	10m3	Accountant	8 Years	Ou Tai - Bdr. Road	Phongsaly
Motor Grader	CD661R	100hp	Zipping	8 Years	Rd. 1A - Ou Tai - Lan Tui	Phongsaly
Bulldozer with Ripper	D53A	100-150hr	Equipment Supervisor	13 Years	Rd. 1A - Boun Neua - Km 7	Phongsaly
Drump Truck		6-10m3	Drivers	9 Years	Rd. 1A - Boun Neua - Km 63	Phongsaly
Pick-up	4WD		Builders	6 Years	Ban Khana - Ban Nam Youan	Phongsaly
Concrete Mixer		1.2m3				
Generator		8kw				
Khamsonh Development Construction Co., LTD.						
Framing Tractor	D53A		Director	19 Years	Road Construction (I)	Xiengkhouang
Motor Grader	GD31&LG2		Deputy Director	16 Years	Road Construction (II)	Xiengkhouang
Excavator	PC220-7,6,3		Consultant President	25 Years	Road Construction (III)	Xiengkhouang
Pay Loader	WA350		Head of Finance	5 Years	Road Construction	Xiengkhouang
Roller	Sakai	12T	Procurement	6 Years	Road Construction	Xiengkhouang
Dump Truck	Isuzu	12T	Construction Manager	2 Years	Periodic Maintenance	Xiengkhouang
Water Distributor	Isuzu	6T	Site Engineer	12 Years	Emergency of Rd. No. 7	Xiengkhouang
Water Fuel Distributor	Hino	12T	Planing Engineer	10 Years	Road Construction	Xiengkhouang
Asphalt Concrete Plant	Ussa		Quality Control	5 Years	Ban Phapher - Houykhong Rd.	Xiengkhouang
Crushing Stone Plant	Standard		Technical Section	11 Years		

2.5 Task Group 3

A general research strategy has been identified that gives the DoR a management and mainstreaming role that and the NUOL to undertake the actual research, possibly in conjunction with provincial engineers. This has been discussed at key meetings over the last month and whilst there appears to be general agreement on the principal, key stakeholders indicate that there is a need to look more closely at the detail of such an arrangement.

The concept of identifying initial SEACAP Research Studies as a means of initiating and giving impetus to a revived Lao road research programme is under active consideration by the project. The research process has been given cautious approval by key stakeholders. In particular, a research study to look at the design and engineering performance of the bituminous sealing of LVRR gravel surfaces has been identified as an initial project. Further details of this and three other potential projects are included as Appendix C to this report.

2.6 Other Project-Related Activities

As mentioned on Section 2.3, discussions were held with Peter O'Neill DfID during his visit to Lao to introduce the need for a new Lao Road Design Manual covering all road classes, and for a research study in Lao, including field studies, to support or otherwise the practice of sealing gravel roads.

Date	Organisation	Key Personnel	Comment
11/04	LRD/DoR	Laokham Sompeth SCC Members	SEACAP 3 Progress Meeting
25/04	DfID	Peter O'Neill, (DfID) David Salter (SEACAP Manager)	Briefing on SEACAP 3 and future research
25/4	DfID Roughton Int.	Peter O'Neill, (DfID) David Salter (SEACAP Manager) Mike James Roughton Vandy Vorasak (LTEC)	Received briefing on SEACAP 17, followed by discussion on common matters
28/04	DfID/SEACAP	Peter O'Neill (DfID) John Gothard (Crown Agents) David Salter (SEACAP Manager)	Supplementary briefing meeting on SEACAP 3 progress and programme held in Phnom Penh, Cambodia

Table 1 Key Meetings

No.	Module Description	Completed	Programme	Activity to End April
Task Group I: Develop Standards and Specifications				
1	Review current situation	80%	75%	Review of documents and extraction of key information continued.
2	Research to fill knowledge gaps	40%	50%	Further identification if some key information sets; eg the PRoMMS database.
3	Draft technical standards	0%	0%	No activity this month
4	Finalise technical standards	0%	0%	No activity this month
Task Group II: Develop a Relevant Training Programme				
5	Training needs assessment	5%	0%	Some intital discussions
6	Training programme elaborated	0%	0%	No activity this month
7	Training course tested and trialled	0%	0%	No activity this month
Task Group III: Develop an Appropriate Research Capability:				
8	Gaps in research capacity identified	60%	75%	Further information accessed on research capacity.
9	Strategy for strengthening research capacity	50%	60%	Outline strategies identified and some key trial projects identified
10	Adoption of strategy by MCTPC	0%	0%	No activity this month
Task Group IV: Initiate Dissemination				
11	Package of materials prepared for dissemination	0%	0%	No activity this month

Table 2 Summary of Module Progress

3 Staff Resources

A summary of the SEACAP 3 staff resources utilised up to the end of April 2007 is presented in the following Table 3

Name	Position	Project Time : April 2007
Dr Jasper Cook (TRL)	Team Leader Geotechnical Specialist	11th April
Michael O'Connell (TRL)	Transport and Road Engineering Specialist and Deputy Team Leader	23rd -30th April
Simon Done (TRL)	Training Specialist	No input
Trevor Bradbury (TRL)	Dissemination and IT Specialist	No input
Bounta Meksavanh (LTEC)	Local Team Leader and Road Engineer Specialist	1st to 30th April
Saysongkham Manodham (LTEC)	Road Engineering Specialist	1st to 30th April
Chittakone Maniphan (LTEC)	Training Support	No input
Mr. Keithiphan Senamahmountry (LTEC)	IT Support	No input
Mr. Bounhom K. (LTEC)	Translator	1st to 30th April
Ms Chandita Ph (LTEC)	Office Management	1st to 30th April
Mr. Thipdavanh V. (LTEC)	Project Coordinator	1st to 30th April

Table 3 Staff Resources April 2007

4 Programme

The current status of SEACAP 3 in relation to the proposed programme is indicated in Appendix D to this report.

It is proposed that the workshop planned for late May to consider the review carried out on Module 1 is rescheduled to coincide with the workshops planned for Module 3 on the road design matrix and the draft standards. It is considered that this approach will permit a more complete and rational presentation of the work done for deliberation and discussion at the workshop.

Key activities in the next month can be summarised as follows:

1. Finalisation of Module 1 synthesis report.

2. Completion of a draft matrix of Lao road environments and potential options for LVRR options likely to be most appropriate (Module 2)

3. Initial work on drafting of LVRR classifications and technical specifications.

4. Finalisation of preliminary research capacity strategy in preparation for a proposed workshop.

5 Key Summary Points

- The Inception Report has been finalised and submitted ,
- A SEACAP Coordination Committee meeting was held and progress reviewed,
- Significant progress continues to be made on Modules 1,and 2
- Data collection to fill information gaps under Module 2 has continued. Work has included further examination of the PRoMMS database for traffic and rural road information, and beginning a rational assessment of international low volume roads manuals and reports for information on road design, pavement design and climatic considerations.
- Progress on Research Modules 8 is satisfactory. Some slippage due to the holiday period will be addressed in the coming months.

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APPENDIX A

SEACAP COORDINATION COMMITTEE MEETING

SUMMARY NOTES

SEACAP 3 Progress Meeting

11th April 2007:LRD

Present:

Loakham Sompeth (Chairman SCC)

Sengdarith Kattignasack (SCC Member)

Chan Bouphalivanh (SCC Member)

Nalasack Sisouphanh (LRD)

Khampaseuth Panyanouvong (LRD)

Manivone K. (PTD)

Dr J R Cook (TRL)

Bounta Meksavanh (LTEC)

Saysongkham Manodham (LTEC)

Following a short introduction Dr J R Cook (TRL-LTEC) summarised the progress on the SEACAP 3 project in March by the TRL-LTEC team. Key points in this presentation were:

- The Inception Report has been drafted and is currently being Quality Assured by TRL
- An Inception Workshop has been held at which the general principals of the Inception Report were agreed
- Significant progress continues to be made on Module 1
- Data collection to fill information gaps under Module 2 has been commenced (sample data tables were distributed)
- A concept note has been submitted on possible SEACAP 3 support of SIDA-SEACAP cooperation

Following the presentation several points were raised by the SCC members as follows:

1. Technical standards should take into account regional variations in resources *TRL-LTEC: Yes, this is a key aspect of the proposed work. Local resources are very much taken into account.*
2. Some comment was requested on the problem of overloading and how the SC3 project would deal with this topic. *TRL-LTEC: the problem can be dealt with by physical*

preventative measures and examples can be given from Vietnam on this. Designing roads for heavy loads is possible but will be costly in the context of basic access .Comment will included in guidance documents

3. Would SC3 be looking at actual materials resources in the field?. *TRL-LTEC This is beyond the current scope of the project which will be relying on existing data. There is a pilot materials database element to the parallel SC19 project in Cambodia and MCTPC/DoR could consider requesting a similar project in Lao from donors.*

4. PTD has currently few resources but has identified some research needs –for example a need for standard specifications on small structures Research needs to be practical. PTD could take a management role and NUOL could be involved. *TRL-LTEC.– there is a need to discuss further the research model in detail A number of small potential research projects have been identified.*

5. There is need to ensure that reported materials still exist. *TRL-LTEC: this point is noted.*

6. We should take into account generated traffic in road design. *TRL-LTEC: Agreed.*

7. The training should consider utilising the SC17 construction programme and the need for contractor training. *TRL-LTEC will assess these useful suggestions.*

8. Socio-economic information also needs to be included in option section/standards. *TRL-LTEC: This is a factor in the over assessment of the LVRR road environment.*

9. SC3 should be aware of the New Year planning process and that additional activities would need to be taken into account*. TRL-LTEC: This is noted.*

J R Cook

SEACAP 3 Team Leader

12th April 2007

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APPENDIX B: PRESENTATION

SEACAP 003

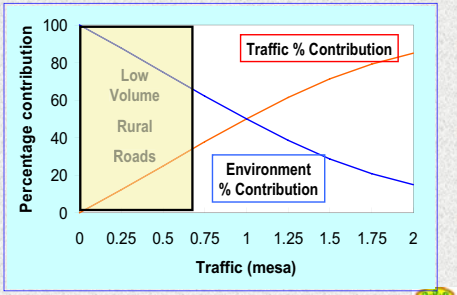
Mainstreaming Appropriate Local Standards and Specifications & Developing a Strategy for MCTPC Research Capacity

TRL Ltd

In Association with

LTEC and Intech Associates

Contributions to Road Deterioration

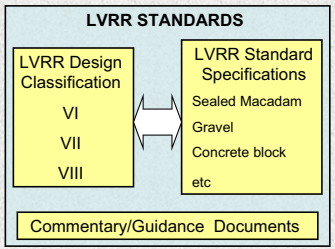


SEACAP 3 Structure

3 Components comprising:

11 modules organised into 4 Work Groups

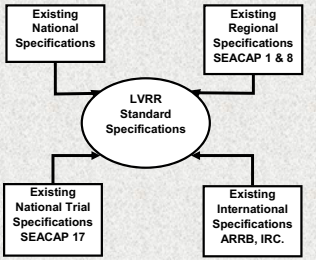
SEACAP 3 : Key Outputs



Appropriate Standards

Variety of pavement or surface options depending on particular road environment requirements

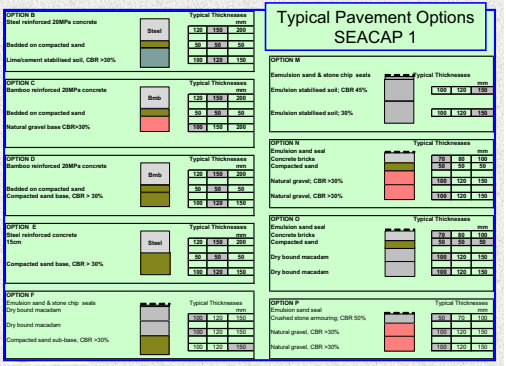
LVRR Specifications



SEACAP 1, 8 and 17 Trials

Sustainable Options Potentially Available

Typical Pavement Options SEACAP 1



SEACAP 3 : Status

- Inception Report – Submitted

Task Group I Standards

- Module 1: 80% complete
- Module 2: 50% complete

Task Group II Research Capacity

- Module 8: 50% complete
- Module 9: 50% complete

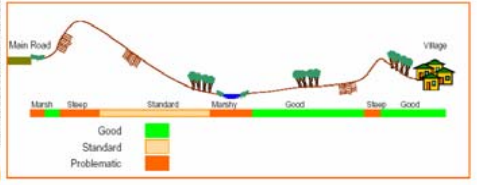
SEACAP 3 : Key Points

Standards
No established system - gaps
Need a pragmatic approach to overloading
Matrix approach; (environments-options)

Research
MCTPC managed – NUoL run
SEACAP Research Studies (SRSs)

Multi-Option (Spot) Construction

Alternative pavement options maybe best suited to selected sections of a project road to ensure all weather access.



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APPENDIX C: SEACAP RESEARCH STUDIES

SEACAP RESEARCH STUDIES

1 Initial Studies

The SEACAP 3 Inception Report noted a number of SEACAP Research Studies (SRS) that could perform the dual function of both infilling identified knowledge gaps and providing trial programmes for the proposed research enhancement strategy. These studies are:

- SRS 1: Performance of locally adopted sealing options on laterite gravel
- SRS 2: Unsealed road performance in Lao PDR
- SRS 3: LVRR traffic patterns in Lao PDR
- SRS 4: Appropriate vehicle operating and road management costs for Lao PDR

2 Performance of Locally Adopted Sealing Options on Laterite Gravel

It is reported that the DoR/LRD has directly overlain a number of gravel roads with thin bituminous seals with the objective of improving their all year round trafficability as well as reducing their maintenance burden, and extending their effective life without the need for re-gravelling. There is, however, anecdotal evidence that these seals are showing signs of distress after only around 2 years of service. There is clear need, within the context of identifying appropriate LVRR paving options, to examine the effectiveness this gravel sealing and to make recommendation on its use.

Key steps in this proposed SRS 1 would be

A. Desk studies to:

- Acquire information on where and when this sealing option has been applied
- Obtain information on relevant costs of construction
- Collect any available data on the nature of the seals and the underlying gravel
- Draft field data collection forms and procedures (could be based on SEACAP 1 and SEACAP 4)
- Draft an initial programme

B Initial field visits and scoping study to:

- Assess the suitability of proposed field procedures and make suitable adjustments
- Assess the proposed programme and make appropriate adjustments
- Undertake short demonstration and training programmes for potential data collecting team(s)

C Data Collection

- Collect data on the current condition of a representative and scientifically valid selection of the sealed gravel roads
- Collect data on the road environment factors impacting on the selected roads
- Collect and test representative samples of the underlying gravel material
- Collect and visually assess samples of the thin seal materials

D Data Analysis

- Collate and QA check all field and laboratory data
- In-put data into a suitable database
- Analyse the performance of the sealed gravel roads in relation to their road environments and the materials used.
- Make recommendations as to the use of this option

3 Unsealed Road Performance in Lao PDR

By far the greatest majority of rural roads with Lao PDR are unsealed; there is however little formally collated information on how they are performing in relation to their impacting road environment factors. Some general information on LVRR road condition within the PRoMMS database and whilst this useful it needs ideally to be expanded and related to road environment.

SEACAP 4 in Vietnam utilised existing World Bank project unsealed gravel roads to provide valuable and detailed data on their condition and performance in relation to key impacting factors. This project would be to able to proved the model for a similar, possibly smaller scale, project in Lao PDR.

Key steps in this proposed SRS 2 would be

A. Desk studies to:

- Select suitable representative provinces to undertake the survey
- Review any available information dates of construction
- Discuss suitable roads for survey with stakeholders (provinces/DoR/donors)
- Collect any available data on the nature of the materials used
- Draft field data collection forms and procedures, based on SEACAP 4
- Draft an initial programme

B Initial field visits and scoping study to:

- Discuss final selection of candidate roads with provincial authorities
- Assess the suitability of proposed field procedures and make suitable adjustments
- Assess the proposed programme and make appropriate adjustments
- Undertake short demonstration and training programmes for potential data collecting team(s)

C Data Collection

- Collect data on the current condition of a representative and scientifically valid selection of unsealed roads, including information relevant to identifying areas for “spot improvement”
- Collect data on the road environment factors impacting on the selected roads
- Collect and test representative samples of the underlying gravel material

D Data Analysis

- Collate and QA check all field and laboratory data
- In-put data into a suitable database

- Analyse the performance of the unsealed gravel roads in relation to their road environments and the materials used.
- Report on the performance of unsealed roads in Lao PDR, based on the collected information
- Make recommendations as to the suitability of a "spot improvement" strategy

4 LVRR traffic patterns in Lao PDR

Although the relative impact of traffic on LVRR is less than on higher volume roads there is till a design need to both define its level and its make-up in terms of vehicle types. In particular the risk of actual and potential axle loading has to be assessed. Traffic assessment is clearly a key road environment issue that needs to taken into account in the proposed SEACAP road environment – pavement option matrix.

SEACAP 3 Module 1 and Module 2 studies have indicated that while there is some useful general information on traffic levels contained within the PRoMMS database, it is based on informal local evidence, some of it anecdotal. Some traffic data is available in relation to ADB road programme projects, however this is largely applicable to roads of a higher classification than those covered by the SEACAP 3 programme. A formal series of traffic counts on a representative selection of LVRRs would be a very valuable source of information for the affective mainstreaming of appropriate LVRR Standards and Specifications.

Key steps in this proposed SRS 3 would be:

A. Desk studies to:

- Assess available LVRR traffic information
- Discuss suitable areas for the study with key stakeholders
- Draft traffic data collection forms and procedures, based on ORN 40 and SEACAP 1 regional experience of its use.
- Draft an initial programme based on a representative selection of LVRRs and which allows a correlation with PRoMMS traffic data

B Initial field visits and scoping study to:

- Assess the suitability of proposed field procedures and make suitable adjustments
- Assess the proposed programme and make appropriate adjustments
- Undertake short demonstration and training programmes for potential data collecting team(s)

C Data Collection

- Collect traffic data on a representative and scientifically valid selection of LVRRs

D Data Analysis

- Collate and QA check all field data
- In-put data into a suitable database
- Analyse the traffic data and establish any correlations possible with other data sets(PRoMMS)
- Report on the implication of the survey outcomes for the design of LVRRs

5 Appropriate Vehicle Operating and Road Management Costs for Lao PDR

The World Bank 2006 draft WB Transport Strategy document identifies life cycle costing as essential for efficient resource allocation. A LVRR whole life cost model has been developed under SEACAP 1 in Vietnam which could be modified to suit Lao PDR conditions. This model aims to support decisions on rural road surface options, but is based on construction and anticipated maintenance costs only and no formal account has as yet been taken either of Vehicle Operating Costs (VOCs) or of other road management costs due to lack of basic information.

Although there is an identified need to develop or calibrate an existing cost model into a complete Whole Life Cost model for Lao PDR, information reviews under Module 1 have indicated that, as with Vietnam, the existing Lao PDR VOC knowledge base for low volume roads is extremely limited.

The proposed SRS 4 would seek to address this knowledge gap by undertaking an assessment of the available models including the cost model developed for SEACAP 1, the Roads Economic Decision Model (RED) and the Highway Development Model (HDM-4) from which the steps for establishing a model for Lao PDR could be established.

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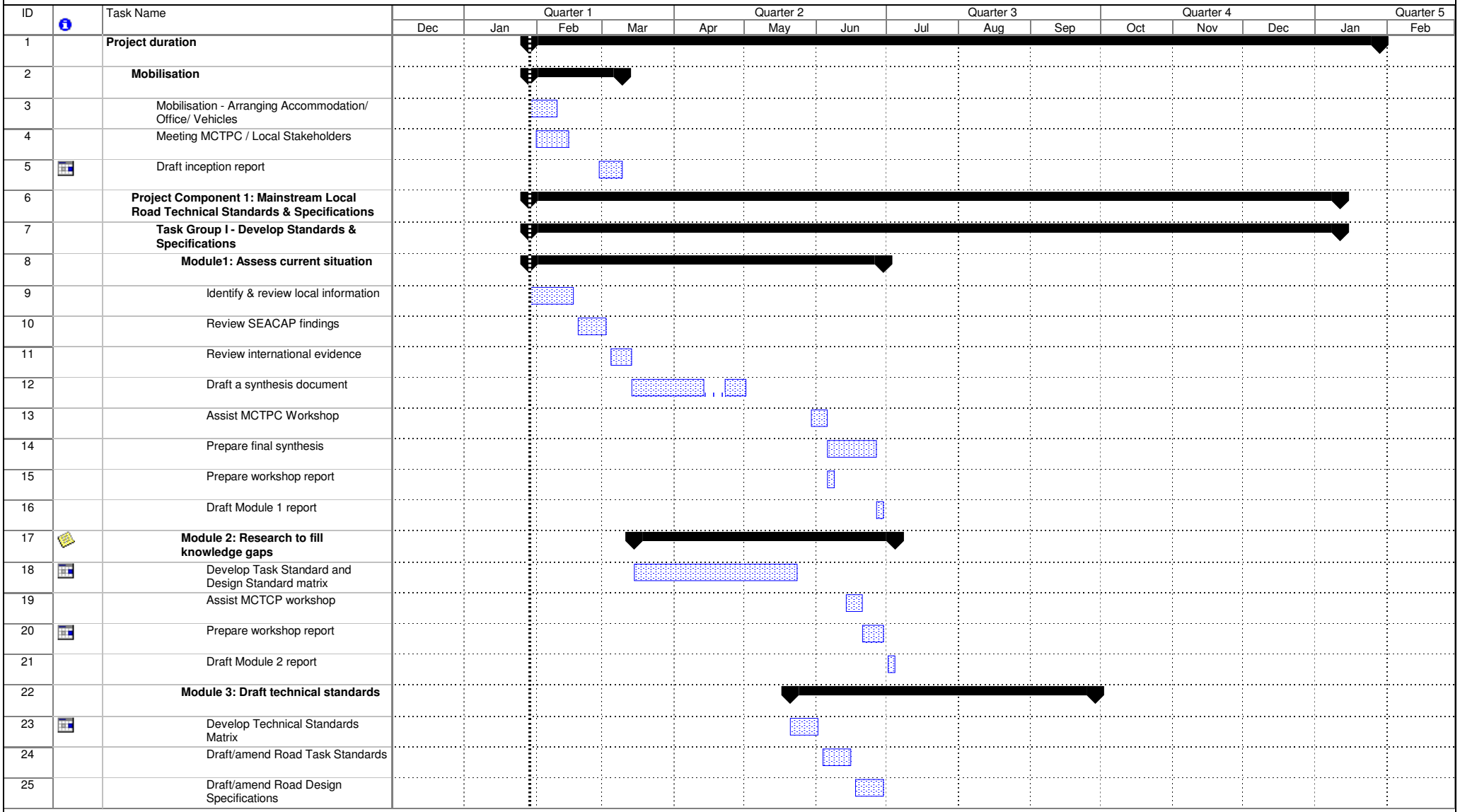
APPENDIX D: SEACAP 3 PROGRAMME AND STAFFING SCHEDULE

SEACAP - 3

Mainstreaming appropriate local road standards and specifications & developing strategy for MCTPC research capacity

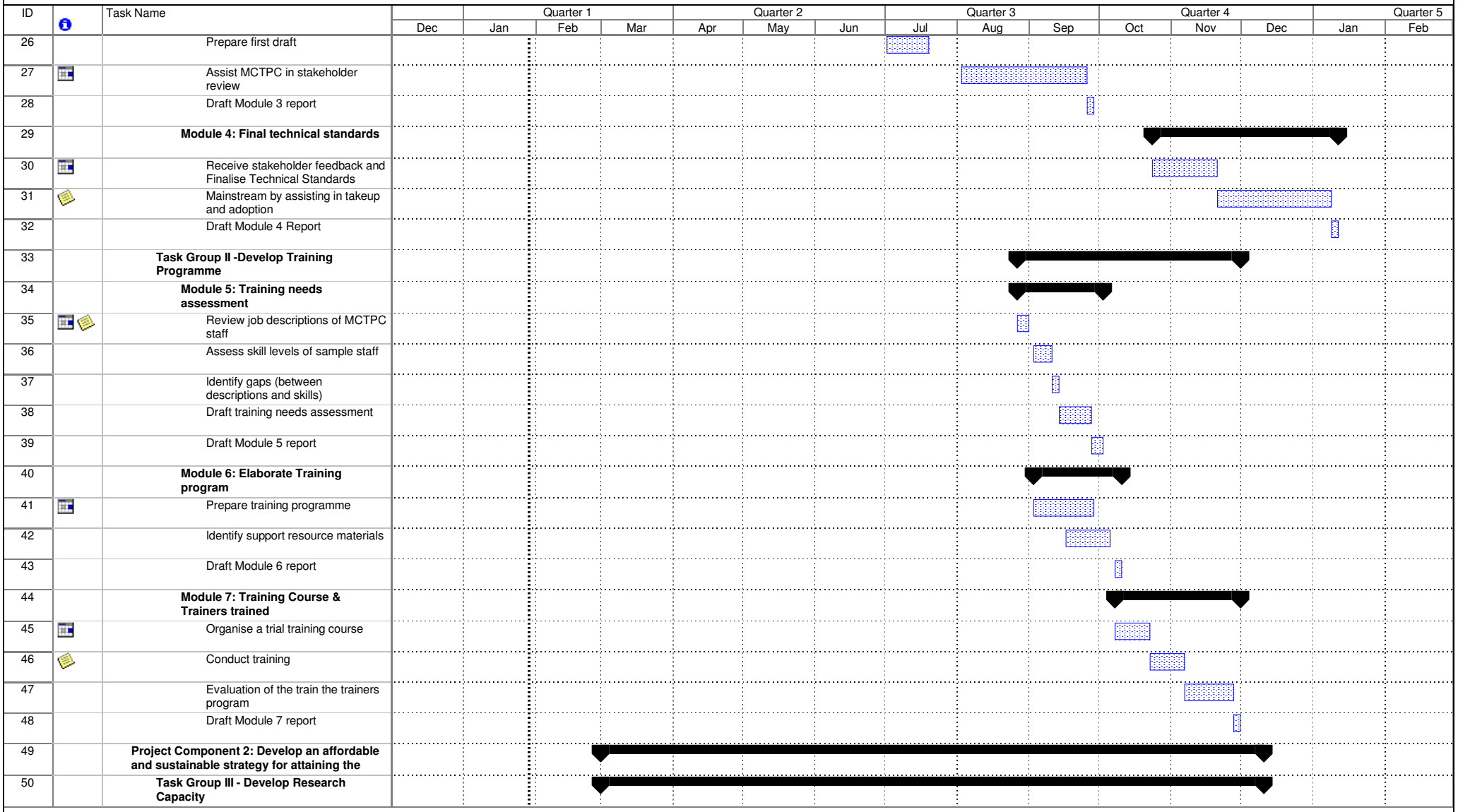


Project: SEACAP 03 - Lao PDR

Task	Summary	Rolled Up Progress	Project Summary		
Progress	Rolled Up Task	Split	Group By Summary		
Milestone	Rolled Up Milestone	External Tasks			

SEACAP - 3

Mainstreaming appropriate local road standards and specifications & developing strategy for MCTPC research capacity



Project: SEACAP 03 - Lao PDR

Task		Summary		Rolled Up Progress		Project Summary	
Progress		Rolled Up Task		Split		Group By Summary	
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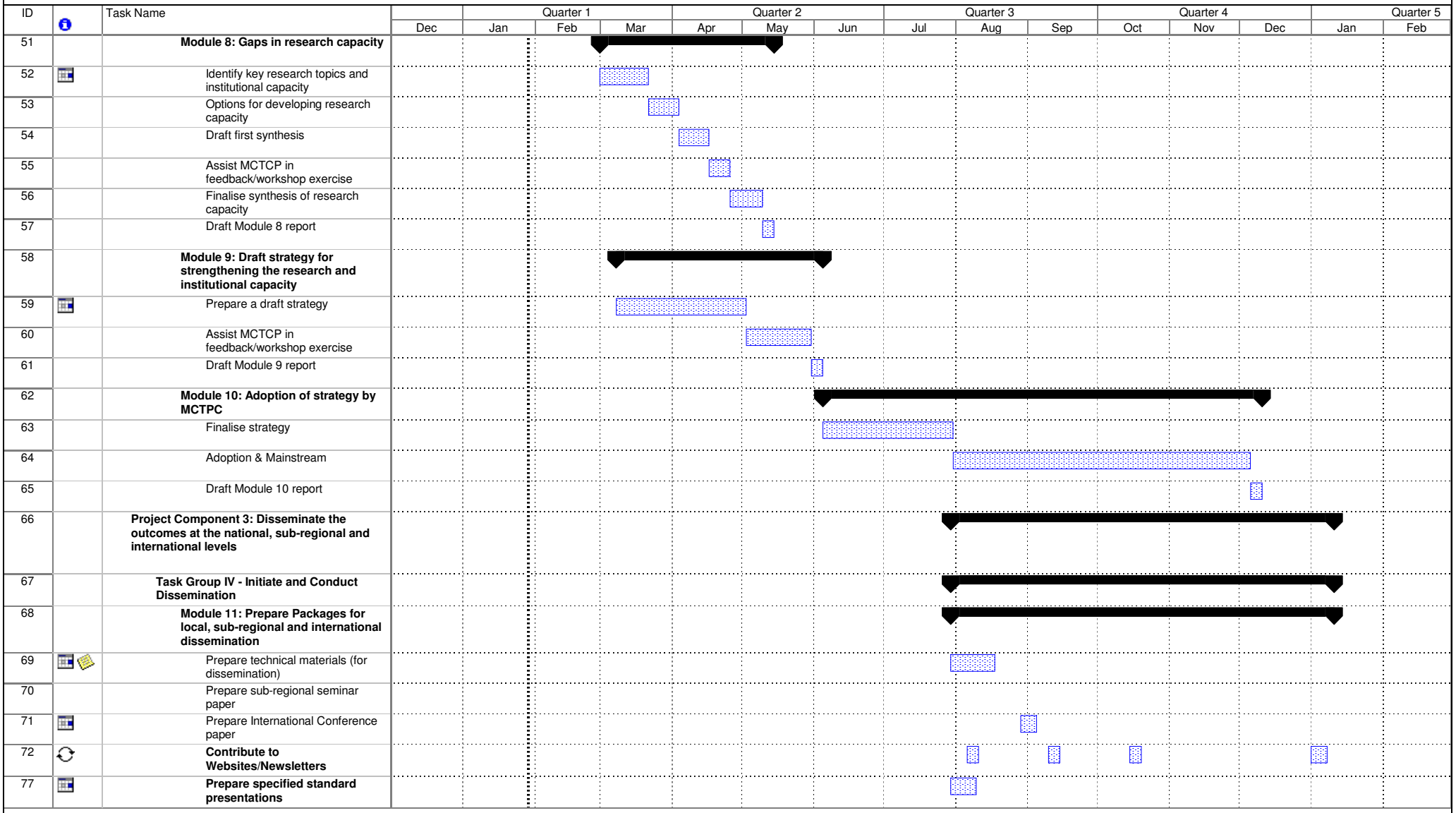
SEACAP - 3

Mainstreaming appropriate local road standards and specifications & developing strategy for MCTPC research capacity



Project: SEACAP 03 - Lao PDR

Task		Summary		Rolled Up Progress		Project Summary	
Progress		Rolled Up Task		Split		Group By Summary	
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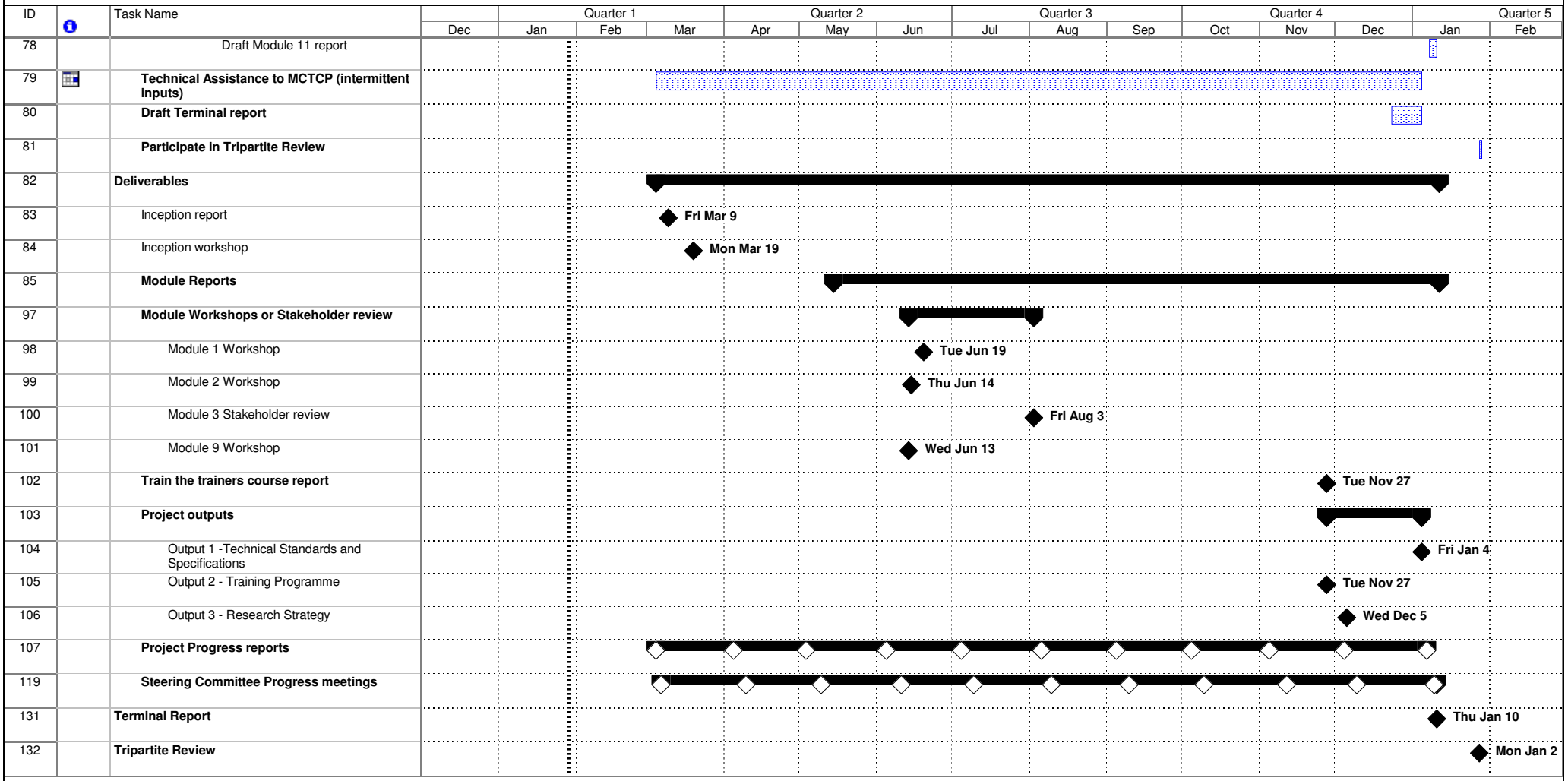
SEACAP - 3

Mainstreaming appropriate local road standards and specifications & developing strategy for MCTPC research capacity



Project: SEACAP 03 - Lao PDR

Task	Summary	Rolled Up Progress	Project Summary		
Progress	Rolled Up Task	Split	Group By Summary		
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SEACAP-3 Schedule of Staff Inputs

ID	Task Name	Position
1	**Project Duration**	
2	**International**	
3	**J Cook**	**Team Leader Geotechnical Specialist**
14	**M O'Connell**	**Transport and road eng. Spec. & Deputy Team**
20	**S Done**	**Training specialist**
22	**T Bradbury**	**Dissemination expert**
24		
25	**Domestic LTEC**	
26	**Bounta MEKSAVANH**	**Local Team Leader and Road Engineer Specialist**
28	**Saysongkham MANODHAM**	**Road engineering specialist**
30	**Keithiphan SENAMAHMOUNTRY**	**IT Engineer**
32	**Chittakone MANIPHON**	**Junior Engineer**
34	**Thipdavane VONGSAY**	**Project coordinator**
36	**Chanthida PHAPHIBOURN**	**Secretary / Office Manager**
38	**Xoumaitri PANYANOUVONG**	**Translator**
47		
48	**MCTPC Counterpart staff**	
49	**Khampaseuth Panyanouvong (LRD)**	**Civil Engineer (LRD)**
51	**Ounheuan Siliamphone (PTD)**	**Senior Technical Staff (PTD)**
53		
54	**Technical Panel**	
55	**R Petts**	**Quality Assurance**
59	**A Ahmedi**	**Research capacity**
61	**A Beusch**	**Training**
63	**B Dzung**	**SEACAP -Vietnam**
65	**P Tuang**	**SEACAP - Vietnam**
67	**H Kackada**	**SEACAP-Cambodia**