

**MINISTRY OF COMMUNICATION TRANSPORT AND  
CONSTRUCTION**

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

**SEACAP 3 Technical Paper No 3**

**DISSEMINATION, MAINSTREAMING AND  
TRAINING STRATEGY REVIEW**

*DRAFT FOR COMMENT*

**SEACAP 03**

**UNPUBLISHED PROJECT REPORT**



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**DISSEMINATION, MAINSTREAMING AND TRAINING STRATEGY REVIEW**

**by  
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***DRAFT FOR COMMENT***

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

**Client:** DfID; South East Asian Community Access Programme (SEACAP) for Department of Roads (DoR), Ministry of Communication Transport Post and Construction (MCTPC), Lao PDR

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<b>Approvals</b>	
<b>Project Manager</b>	
<b>Quality Reviewed</b>	

# CONTENTS

<b>Abbreviations &amp; Acronyms</b>	<b>i</b>
<b>Executive Summary</b>	<b>ii</b>
<b>1. Introduction</b>	<b>1</b>
1.1. SEACAP 3 - Mainstreaming Appropriate Local Road Standards and Developing a Strategy for the MCTPC Research Capacity	1
1.2. Rationale for Mainstreaming Low Volume Rural Road Standards	1
<b>2. Study Approach</b>	<b>2</b>
2.1. Dissemination and Mainstreaming Principles	2
2.2. Methodology	3
<b>3. Situation Analysis</b>	<b>4</b>
3.1. Involved Partners	4
3.2. Capacity Assessment	5
3.2.1 Existing Capacity of MCTPC, DCTPCs and OCTPCs	5
3.2.2 Existing Capacity of the Private Sector	6
3.2.3 Capacity to Develop, Manage and Deliver Training	7
3.2.4 Capacity to Identify, Manage and Implement Research Projects	8
3.2.5 Training Needs with Respect to LVRRS	8
3.2.6 Concluding the Capacity Assessment	9
3.3. LVRR Standards and Training Modules for Mainstreaming	9
3.4. Challenges and Opportunities for Mainstreaming the SEACAP-3 LVRR Standards	10
<b>4. Prerequisites for Effective Dissemination and Sustainable Mainstreaming</b>	<b>10</b>
4.1. Requirements for Sustainable HRD Capacity	10
4.2. Enabling Environment	11
<b>5. Strategy Options</b>	<b>12</b>
5.1. Strategy Overview	12
5.2. HRD and Research Capacity	14
<b>6. Follow-up</b>	<b>17</b>
<b>Acknowledgements</b>	<b>18</b>
<b>References</b>	<b>18</b>
<b>Annexes</b>	<b>19</b>
Annex I: Organisation Chart MCTPC	19

## Abbreviations & Acronyms

<b>ADB</b>	African Development Bank
<b>DCTPC</b>	Department of Communication Transport Posts and Construction (Provincial and Municipality Level)
<b>DIID</b>	Department for International Development
<b>DoR</b>	Department of Roads
<b>GMSARN</b>	Greater Mekong Sub-region Academic and Research Network
<b>GoL</b>	Government of Laos
<b>HQ</b>	Headquarters
<b>HRD</b>	Human Resource Development
<b>HRDP</b>	Human Resource Development Plan
<b>IFG</b>	International Focus Group
<b>IFRTD</b>	International Forum for Rural Transport Development
<b>ILO</b>	International Labour Organisation
<b>LRD</b>	Local Road Division (of DoR)
<b>LSRSP</b>	Lao-Swedish Road Sector Project
<b>LVR</b>	Low Volume Rural Roads
<b>LVRSS</b>	Low Volume Rural Roads Standards
<b>Km</b>	kilometre
<b>MCTPC</b>	Ministry of Communication, Transport, Post and Construction
<b>NGPES</b>	National Growth and Poverty Eradication Strategy
<b>NUOL</b>	National University of Laos
<b>PAD</b>	Personnel and Administration Division (of MCTPC)
<b>PTD</b>	Planning and Technical Division (DoR)
<b>QA</b>	Quality Assurance
<b>OCTPC</b>	Office of Communication Transport Posts and Construction (District Level)
<b>RAD</b>	Road Administration Division (of DoR)
<b>RHI</b>	Research, HRD and Information (Division)
<b>RITA</b>	Research management, Information services, Training management and Advisory services
<b>Ref.</b>	Reference
<b>SCC</b>	SEACAP Steering Committee
<b>SEACAP</b>	South East Asia Community Access Programme
<b>SIDA</b>	Swedish International Development Cooperation Agency
<b>SOE</b>	State Owned Enterprise
<b>TCTI</b>	Telecom and Communication Training Institute
<b>TOR</b>	Terms of Reference
<b>TRL</b>	Transport Research Laboratory
<b>UK</b>	United Kingdom
<b>VMC</b>	Village Maintenance Committee

## Executive Summary

The SEACAP 3 project is tasked with reviewing and revising Low Volume Rural Road (LVRR) standards and specifications for Lao PDR. As part of this project a review of current capacities to disseminate and mainstream the project's findings and reports mainly through integrated Human Resource Development mechanisms has been carried out. Based on this capacity assessment a comprehensive strategy has been developed that encompasses all involved partners in government and private sectors.

The following are the major issues:

1. There is a strong link between the existence of adequate infrastructure and achievement of the Millennium Development Goals, including poverty reduction. Much of the knowledge and information concerning the role of transport in development is not available to those who make policy and technical decisions in these areas. Better-informed transport development is particularly pro-poor.
2. The National Growth and Poverty Eradication Strategy (NGPES) of the Lao PRD clearly states that infrastructure development and HRD are key strategy pillars for achieving the set objectives. Effective dissemination and sustainable mainstreaming of appropriate Low Volume Rural Roads Standards (LVRRS) are important activities in achieving the stated poverty reduction goals. Continued research is essential in ensuring innovation and further development of locally applicable solutions to road design, choice of materials and work approaches.
3. HRD in the context of the Laos' construction sector as a national programme is to be based on four main strategic elements; i) basic education, ii) demand for knowledge and skills, iii) provision of higher education and proficiency training, and iv) innovation, research and development. The HRD strategy links these four elements.
4. The analysis of the current situation shows that a number of partners at different levels and in different sectors (government, private, public, education) are involved in planning, management, construction and maintenance of rural low-volume roads or provide support services to it. Consequently, these are also the partners that have to be considered in a dissemination and mainstreaming strategy.
5. The current capacity in terms of roadwork planning and implementation shows some limitations, particularly at district level and in the private sector.
6. The National University of Laos (NUOL) runs civil engineering degree and higher diploma courses and has an annual turnout rate of approximately 120 to 200 graduates. This appears to be sufficient to satisfy the local market. Proficiency training for technical personnel in the government and private sector, however, is not institutionalised and mainly provided through projects. The semi-autonomous Telecom and Communication Training Institute (TCTI) focuses mainly on the telecom sector while road engineering related courses are seldom run.
7. Research management and implementation are in principle in the hands of MCTPC and NUOL. Recent discussions with SEACAP 3 have resulted in an improved research strategy. However, training and information services are not directly connected to it and the private sector as a potential strong research partner is not included.
8. Training and/or awareness creation with the aim to disseminate and mainstream LVRR standards may be provided to technical staff from LDR, DCTPCs, OCTPCs, other ministries dealing with LVRR, consultants, contractors, politicians and decision makers, Village Maintenance Committees (VMC) and communities, and lecturers from NUOL and other universities and technical colleges.
9. SEACAP 3 will produce LVRR geometric standards, outline pavement designs and specifications and advice on drainage. For dissemination purposes the project will also produce 4 training modules with a set of lecturers' notes and Power Point presentations.
10. The main challenges to mainstream LVRR standards are:

- The SC-3 project duration (one year) is insufficient;
  - Reaching acceptance of (new) standards;
  - Limited existing implementation capacity;
  - Limited research capacity;
  - Not all of the LVRR standards have been tested in the context of the Laos environment.
11. Opportunities for successful mainstreaming LVRR standards are:
    - Willingness from many partners to deal with the challenges;
    - Common understanding amongst government departments and support agencies that providing access is an issue, which requires appropriate local resource-based solutions.
    - Long-term involvement of LSRSP and other support projects is a sound basis for further developments;
    - The Basic Access component of the LSRSP provides an excellent platform for dissemination, training and mainstreaming of LVRRS in 26 of the poorest districts;
    - NUOL is keen in absorbing new local-based engineering solutions and practices as well as playing a key-role in implementing research;
    - MCTPC have been given the authority to employ additional engineers to ensure all currently vacant positions within LRD, DCTPCs, and OCPTCs are filled.
  12. There are a number of requirements to reach a sustainable HRD capacity of which the most important are the development of HRD plans, establishment of effective training management, creation of sufficient training delivery capacity, integration of LVRR standards into university curricula, adequate and reliable training funding and continued support. To achieve a sustainable HRD impact an enabling environment is the core prerequisite.
  13. Recommendations for a comprehensive Mainstreaming and HRD Strategy include a set of “building blocks” (measures) in following main areas:
    - The SEACAP 3 outputs will set a base on a short-term basis,
    - Planned HRD activities are the core measures to ensure sustainability,
    - Contract and Quality Assurance Management are issues that need to be addressed to ensure full impact on the operational level,
    - Research and Information Services are required to further develop the technology and effectively disseminate results,
    - Support and mentorship services are required to achieve the long-term objectives and sustainability.
  14. To ensure effectiveness and sustainability the above areas of measures need to be integrated into one strong management unit for Research Management, Information Services, Training and Advisory Services. For this reason it is recommended that MCTPC under the DOR creates a new Research, Human Resource and Information (RHI) Division.
  15. It is recommended to use this paper as a basis for further discussion and follow-up actions within the Steering Committee of SC-3 and an agreed strategy carried forward to the MCTPC for implementation.

# 1. Introduction

## 1.1. SEACAP 3 - Mainstreaming Appropriate Local Road Standards and Developing a Strategy for the MCTPC Research Capacity

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 (LVRRs). 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 document focuses on the dissemination and mainstreaming strategy with particular emphasis on Human Resource Development (HRD) by reviewing the current situation concerning the existing implementation capacity at all levels and the actual capacity to deliver training for the rural infrastructure (road) sector. The paper further outlines potential solutions for other mainstreaming mechanisms and suggests steps to be undertaken to ensure sustainability. In addition the paper also investigates the possibilities for attaining a sustainable road technology research capacity.

Local ownership is vitally important for sustainability; therefore the recommendations herein are not intended to be absolute but are presented as a basis for discussion on the way forward. Ultimately it is likely to fall to the SEACAP Coordination Committee or the DoR as the key stakeholders to make key decisions as to the way forward after the SEACAP 3 project finishes in February 2008.

## 1.2. Rationale for Mainstreaming Low Volume Rural Road Standards

There is a strong link between the existence of adequate infrastructure and achievement of the Millennium Development Goals, including poverty reduction. Most poverty assessments cite access as a key aspect associated with deprivation, and the ability for the transport sector to facilitate access therefore has a key bearing on poverty incidence. However, much of the knowledge and information concerning the role of transport in development is generally not available to those who make policy and technical decisions in these areas. Applying appropriate knowledge to transport policy and technical development enables the sector to perform more effectively its role of supporting the national economy and social development. Being transparent and locally based, this supports good governance and is socially inclusive. Better-informed transport development is particularly pro-poor since it:

- Reduces transport costs for people, crops, goods and services for the communities,
- Improves access to education, health-care, markets, employment opportunities and other facilities,
- Reduces the vulnerability of isolated rural and urban communities, and so improves security,
- Supports empowerment of communities, by facilitating social networking and physical access to the democratic process,
- Contributes to economic growth, and hence to economic opportunities.

The National Growth and Poverty Eradication Strategy (NGPES) of the Lao PRD clearly states that infrastructure development and HRD are key strategy pillars for achieving the set objectives. The human resource development priorities are:

- Training and development to enhance professionalism in the civil service;
- Increased knowledge, ability and qualifications of civil servants in accordance with needs; and
- Training of DCTPCs, OCTPCs, local contractors and consultants, and road service providers to strengthen the road transport industry.

Within the above framework effective dissemination and sustainable mainstreaming of appropriate LVRR technology are important activities in achieving the stated poverty reduction goals. Continued

research is essential in ensuring innovation and further development of locally applicable solutions to road design, choice of materials and work approaches.

## 2. Study Approach

### 2.1. Dissemination and Mainstreaming Principles

The most important means for the mainstreaming and disseminating knowledge, best practices, and on-going research and development work for the principally rural road sector are well-planned, coordinated and implemented Human Resource Development (HRD) activities for all involved organisations and persons coupled with widely available information material. This paper has been developed with this in mind.

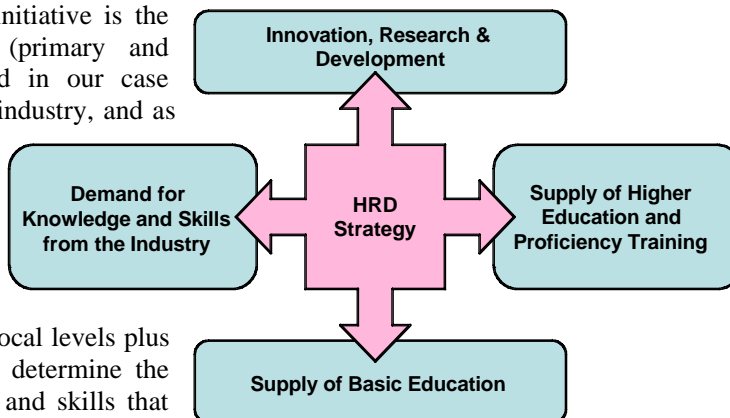
**Human Resources** are the people that work for an organisation, and Human Resource Management is concerned with how these people are managed. However, the term Human Resource Management (HRM) means more than this because people are different from the other resources that work for an organisation. People have thoughts and feelings, aspirations and needs.

**Human Resource Development** is the process of enhancing the potential of people (as individuals and groups) to perform better in all spheres of life. People's potential can be developed through training and capacity-building, access to opportunities, and access to an environment which supports their development.

The starting point is an analysis of the current situation with regards to HRD in the roads sector in Laos.

This study is further based on a principle understanding of HRD functions that link the four main strategic elements:

1. The foundation for any HRD initiative is the **supply of basic education** (primary and secondary) to the society, and in our case particularly to the construction industry, and as such, is a determining factor for further capacity development inputs.
2. On the **demand side**, employers, in our case the Government of Laos (GoL) at central, provincial, district and local levels plus the private construction sector, determine the kind and degree of knowledge and skills that are required by their employees. For public infrastructure the ultimate users and beneficiaries (the concerned communities) also have to be included on the demand side, as they are directly and indirectly involved in infrastructure management and works, mainly through Village Maintenance Committees (VMC).
3. The **supply side** (e.g. National University of Laos) provides the required further, or tertiary, education that prepares professionals for the job market. However, this is normally not sufficient, as the practical requirements of the employers often differ and change over time. Additional proficiency (upgrading) training is usually required at all levels in all organisations as a fundamental input to make people fit for the job.
4. **Innovation and research** are the essential inputs for developments to take place. These originate from international and national initiatives and need to feed into both the demand and supply sides. In the case of rural roads in Laos, the SEACAP 3 project is one among several other innovative projects that have been undertaken and included adaptations from appropriate international technology solutions as well as new international and national research results.
5. The **HRD strategy** provides the linkage of the four elements by mainly ensuring coordination between the four sides, developing and facilitating enabling tools, and collating and disseminating





information to the respective sides. Further strategic elements include performance monitoring and planning for new developments.

It is also important mentioning that HRD for this study is perceived as a capacity building effort both for the concerned organisations and for individuals.

However, effective and sustainable mainstreaming is not only a result of HRD activities but also of other important factors that need to be addressed, such as:

- Provision of adequate information using appropriate mechanisms,
- Acceptance of research results and support for implementation by politicians and decision makers, implementing and support authorities, professionals, and eventually the public,
- Capacity to manage and implement tailor-made training programmes for all involved parties,
- Capacity to absorb and transfer research results into practise by the respective government departments and the construction industry.

## **2.2. Methodology**

The methodology adopted for the development of this dissemination and mainstreaming strategy paper consists of a logic series of activities:

- Analysing the current situation with regards to existing capacities, training needs, constraints and opportunities;
- Identifying important prerequisites for effective dissemination and sustainable mainstreaming;
- Developing strategy options;
- Identification of follow-up actions.

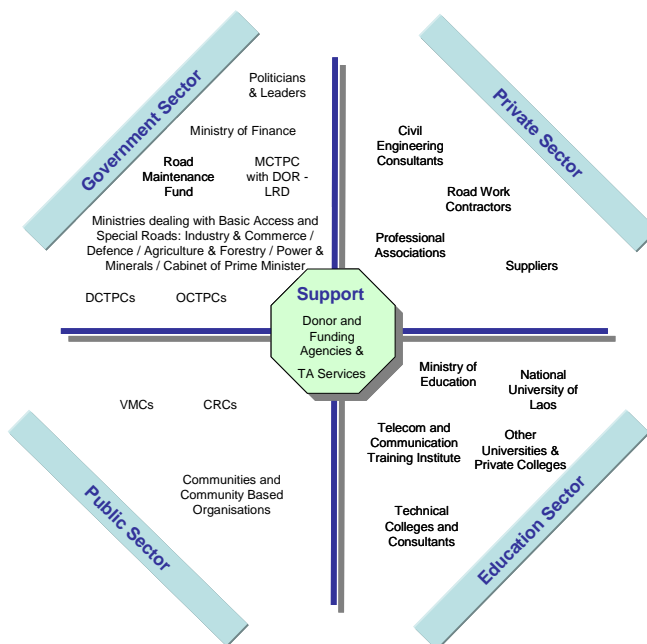
The above steps have been carried out through interviews and by examining the available documentation.

The strategy options of this paper have been developed based on logical conclusions from the situation analysis, ideas and visions from the interview partners as well as from international experience from similar cases, e.g. SEACAP 2, Cambodia Transport Mainstreaming Partnership and many others.

### 3. Situation Analysis

#### 3.1. Involved Partners

Currently a number of partners at different levels and in different sectors are involved in one way or the other in the planning, management, construction and maintenance of rural low-volume roads or provide support services to it. Consequently, these are also the partners that have to be considered in a dissemination and mainstreaming strategy. The figure illustrates the partnership 'landscape' while the following table provides details on roles and functions of the various partners.



Partnership and Cooperation Analysis for Mainstreaming LVRR Standards			
Sector	Organisation	Main Functions and Roles	Action Required for Mainstreaming
Government	Politicians and Leaders	Policies and decision making,	Accepting, creating awareness and representing
	Ministry of Finance	Government financial control, budgeting and disbursement of development funds	Accepting consequences
	Road Maintenance Fund	Management and disbursement of road maintenance funds	Accepting and representing
	Ministry of Communication, Transport, Post and Construction, Department of Roads, Local Road Division (of MCTPC)	→ Policy framework formulation, → Standards and norms, → Overall planning, coordination and monitoring → Overall budgeting and financial control	→ Accepting and integrating draft standards into relevant documentation as official national standards → Follow-up research activities for LVRR issues
	Other Ministries dealing with Basic Access and Special Roads	→ Policy framework formulation, → Standards and norms, → Overall planning, coordination and monitoring	Accepting and adopting as national standards
	Departments of Communication, Transport, Posts and Construction (provincial level)	→ Strategic planning, → Programming and monitoring	Accepting and implementing
	Offices of Communication, Transport, Posts and Construction (district level)	→ Project and fiscal planning, → Preparation, monitoring and evaluation	Accepting and implementing

Partnership and Cooperation Analysis for Mainstreaming LVRR Standards			
Sector	Organisation	Main Functions and Roles	Action Required for Mainstreaming
Support	Donor and Funding Agencies	Providing funds and technical assistance	Accepting and supporting
	Donor funded project TA units	Providing advisory services on project operational level	Raising awareness and providing training
Public	Community Road Committees	→ Be part of decision making / planning → Be involved in implementing works	Accepting and implementing
	Village Maintenance Committees		
	Communities and Community Based Organisations		
Education and Training	Ministry of Education	Approving and accrediting curricula	Approving and accrediting reviewed civil engineering curricula for degree and higher diploma courses
	National University of Laos	→ Developing and providing degree (BSc) and higher diploma courses in civil engineering → Providing research services	→ Reviewing and updating existing civil engineering curricula and courses → Implementing courses → Carrying out follow-up research
	Luang Prabang and Champasack Universities plus Private Colleges	Developing and providing higher diploma courses in civil engineering	→ Reviewing and updating existing/developing new civil engineering curricula and courses Implementing courses
	Telecom and Communication Training Institute	Providing training as a semi autonomous institution	Providing contracted training
Private	Civil Engineering Consultants	Designing and supervising road construction works	Adopting and implementing as per contract
	Road Work Contractors	Implementing contract roadworks	Adopting and implementing as per contract
	Professional Associations	Representing industry	Accepting, informing members and supporting
	Suppliers	Supplying construction material and equipment	Adopting and implementing as per contract -

### 3.2. Capacity Assessment

#### 3.2.1 Existing Capacity of MCTPC, DCTPCs and OCTPCs

The MCTPC consists of 8 Departments (see organisation chart in Annex I). One of them is the Department of Roads (DOR) with a dedicated Local Road Division (LRD). The LRD is currently responsible for the approximately 15,000km of existing district and rural roads. In addition, about another 11,000km of roads are planned to be improved and included in the district and rural road network by the year 2020. Most of these roads may be termed as 'low volume roads' and are therefore the focus for SEACAP 3 activities. The MCTPC through its LRD is mainly responsible for the overall management of the rural road network including setting

Technical Staff under DOR		
Level	2007	by 2010
LRD Central	154	166
DCTPCs	314	383
OCTPCs	NA	NA
Total	---	---

priorities to DCTPCs (provincial departments) to guide preparations of development/maintenance programmes and reviews/approves DCTPC development/maintenance programmes. As derived from interviews and personnel statistics, LRD currently does not have enough professional capacity in terms of sufficient numbers of qualified and experienced engineers. Currently there are still two SIDA funded projects (Lao-Swedish Road Sector Project III, maintenance and basic access components) supporting the LRD. These two projects will come to and end in 2009.

Research within the DoR is the responsibility of the Planning and Technical Services Division (PTD). However, it currently has no specific capacity assigned to actually identify, plan and manage research projects.

At **provincial level DCTPCs** are responsible for the strategic planning and supervision of rural road works. Through the ongoing decentralisation process increasing responsibilities and resources are allocated to the DCTPCs. In general, their capacity in terms of professional and experienced personnel is inadequate and needs to be strengthened. One of the focus activities of the Lao-Swedish Road Sector Project (LSRSP) maintenance component is to provide management support and training to DCTPCs. Recently, the project carried out a performance assessment of the engineering staff. The average performance capacity was identified at 3.3 on a scale of 1 to 5, which means that at present DCTPC staff are not yet able to independently and fully master the given jobs.

**An indicative TNA by SC3 concludes:**  
Most District Engineers have Bachelor degrees. The remainder have high school qualifications. Some are newly qualified, others have up to 10 years experience. OCTPCs have 2-4 road engineers each.

**Capacity Level 3:**  
Operates with limited external support. The result will be achieved if the staff is periodically supported, or continuously supported to a certain extent (removal of support will slow the pace at which the result will be achieved).

The **OCTPCs** are basically responsible for the implementation of rural road works together with VMCs. However, their capacity to independently and professionally manage the given work is at present rather limited and needs to be seriously developed. This is part of the ongoing decentralisation process and will naturally take time to become fully effective.

### 3.2.2 Existing Capacity of the Private Sector

The private construction sector in this paper includes private consultants and contractors as well as State Owned Enterprises (SOE).

In total approximately 147 **domestic contractors** are registered and available for varying types of roadwork contracts (MCTPC register OCT 2005). Out of this number 13 companies are SOEs. The registration subdivides the contractors into three classes according to their ability to manage sizes of contracts (contract amounts). A recent review of the contractors' capacity by the SC3 project shows clearly that these contractors have a limited ability to engage in road contracts more demanding than than earth and gravel works. In fact only 6 contractors are qualified for asphalt works. Contractors in Laos face a number of constrains to further developing their capacity. These include difficulties in obtaining finances and securities; lack of sufficient work volume; lack of sufficiently capable and skilled personnel; and competition from foreign companies. Proficiency training for contractor personnel has been provided by MCTPC and DCTPC. Project related training is also provided through various projects to those contractors who are actively involved in contract works. The contractors themselves do not have any capacity to organise and finance trainings, for example through a contractor association.

In Lao there is no **contractor association** or any other similar body that represents the contractors' interests. Some attempts have been made in the past to form an association without any real success. Apparently most contractors do not really see the benefits of such an association.

The Lao **consulting industry** is about 15 years old and is therefore at a relatively early stage of development. Approximately 50 consulting entities (including local representatives of international firms) are currently offering services to the infrastructure construction sector. An ADB commissioned study (ref. ND LEA, Institutional Capacity Building, 2005) identified some key challenges:

- A general lack of experience in preparing proposals,
- A general lack of discipline and competitive business perspective,
- A lack of independent support and guidance (e.g. by an association), and
- Inadequate incentives from the Government to facilitate development of the industry.

LTEC as an SOE currently dominates the road transport consulting industry by its size and volume of contract work.

There is no **consultant association** in Lao, neither for the entire consulting sector nor for the construction industry in particular. The need for it plus support requirements have been identified but no further development steps have been undertaken so far.

### 3.2.3 *Capacity to Develop, Manage and Deliver Training*

The **NUOL Civil Engineering Department** provides basic engineering education through their Bachelor and Higher Diploma courses. The current turnout is about 120 – 200 engineers per year. The department also runs Master Degree courses with an annual turnout rate of about 15 to 20 professionals. The curriculum for the Bachelor course has recently been reviewed and three new subjects (modules) relevant to low volume roads have been added, namely

- Rural development and engineering,
- Rural transport infrastructure engineering, and
- Rural engineering materials and techniques.

The department also provides short-term courses with civil engineering content to any client on a demand basis, e.g. MCTPC professional upgrading courses.

Besides NUOL there are two new additional universities (Luang Prabang and Champasack) plus Private Colleges which currently provide civil engineering higher diploma courses.

The semi-autonomous **Telecom and Communication Training Institute (TCTI)** was formed in 1997 by merging the School of Telecommunication and Post and the Road Training Centre. The school has three basic divisions, which include road management and maintenance. Currently only minor training for the road sector can be expected from TCTI. The reasons are the relatively high course fees plus the reduced training delivery capacity for the road transport sector since the main focus has shifted to the telecommunications sector. As a result, TCTI does not appear to be able to respond to the training needs for mainly proficiency training of MCTPC, DCTPCs and OCTPCs.

Projects that support the road sector offer training programmes but these are generally project related (e.g. LSRSP3) or not institutionalised (e.g. ADB's RMP-2). However, these projects have developed, and will continue to develop very valuable training courses and material that could eventually be institutionalised.

Training for the DOR is 'managed' by the Personnel and Administration Division (PAD). Currently a general Training Master Plan exists for 2007 while a new plan is being developed for 2008. These plans list the courses that are offered by the various supporting agencies in the road sector but not necessarily reflect the actual training needs based on an overall DOR Human Resource Development Plan (HRDP). Therefore, the Training Master Plan is more supply than demand driven and PAD is more an agent for training organisation rather than for development and management.

### 3.2.4 Capacity to Identify, Manage and Implement Research Projects

In the past, research requirements for the road sector in Lao have been mainly identified through support projects funded by donors and are therefore more related to finding solutions on a project basis. On the other hand, NUOL in consultation with MCTPC's Planning & Technical Division (PTD) has identified a wide range of collaborative research activities. However, it is uncertain whether these are also priority research requirements in real terms. In any case, the identification of the research topics appears to be arbitrary rather than based on a scientific analysis of causes and effects for solving important technical problems. At the same time it is almost certainly the case that significant regional and international research has already been conducted in relevant areas with results that could be adopted for the Lao environment. There is therefore a need to also have an increased capacity to source, obtain and review research results from elsewhere and to participate actively in international circles with similar interests.

#### Road research requirements identified by NUOL:

- Soil compaction control using light mechanical roller for rural road construction and maintenance
- Slope Stabilization using local materials.
- Sandy Silty Soil improvement for road construction and maintenance
- Relationship between rainfall intensity-vegetation's roots and erosion
- Existing bridge assessment and maintenance
- Rainfall intensity and relationship between intensity-duration-frequency
- Road surface materials
- Bamboo as building, bridge and road structural material
- Road structure strength and deformation behavior
- Stone masonry retaining wall
- Factors influencing the quality of road construction project
- Road construction and maintenance quality monitoring
- Environmental impact assessment of road construction
- Soil stabilization and improvement

The private construction sector has not so far had any particular hand in identifying and financing research activities unless it was specifically asked for in an awarded contract.

The PTD is basically responsible for managing research activities but is limited in its operations due to budgetary and other resource constraints. PTD is also not directly linked with training planning and management.

The NUOL has been involved in a number of research projects, partly in collaboration with other (international) partners. It has no funding provisions of its own for research activities and fully depends on external support. A key problem is that the priorities according to NUOL and PTD might not be the same as those pursued by donor-funded projects.

Domestic consultants and consulting firms have been involved in the implementation of research projects either together with NUOL or through joint venture arrangements with international firms.

In a summary it may be concluded that research for the road sector lacks focussed management, is not necessarily demand driven, is limited in extent and is currently by no means sustainable.

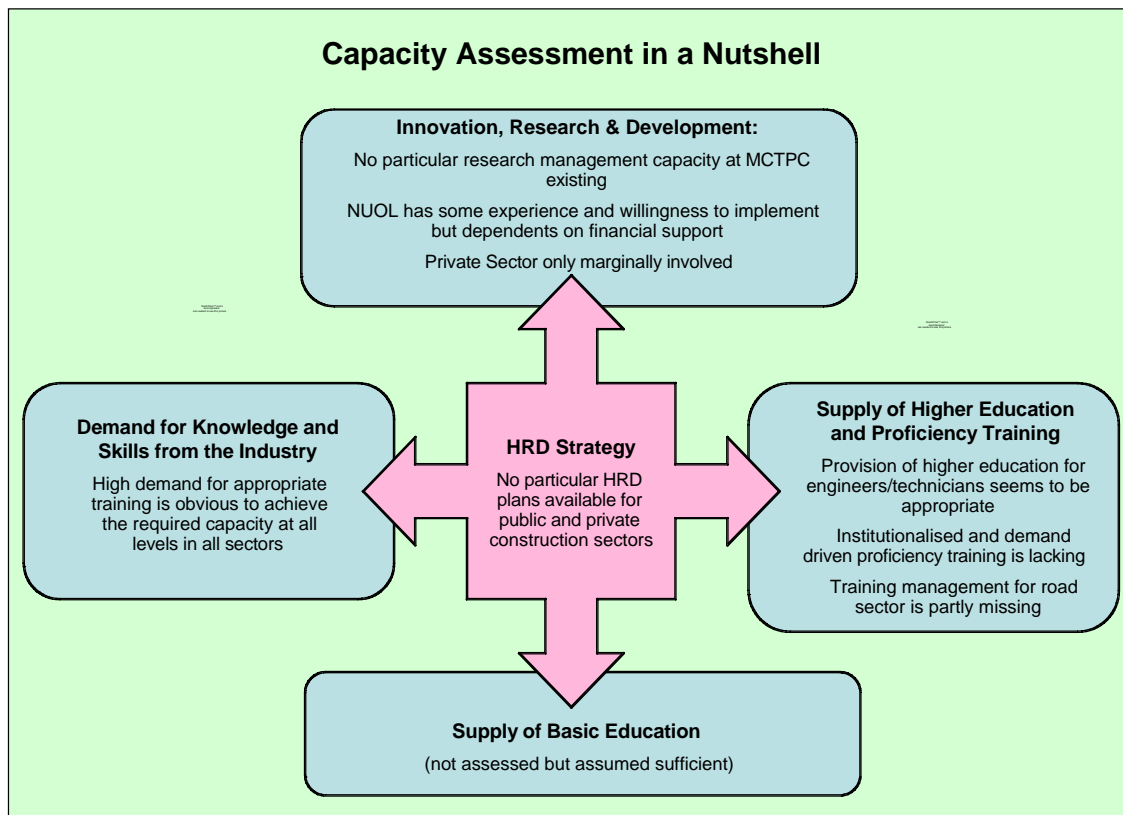
### 3.2.5 Training Needs with Respect to LVRRS

Much of the general training needs are obvious from the capacity assessment described in the subsections 3.2.1 to 3.2.4 above. In terms of specific training needs for the LVRR Standards to be fully and sustainably mainstreamed the following training / dissemination dimensions have to be considered:

- **DOR (MCTPC), DCTPC and OCTPC staff;** in total of around 750 technical personnel require introduction/training on the application of LVRR Standards for planning, designing and contract work preparation and supervision including quality control;
- **Other Departments' technical personnel** dealing with low-volume roads require introduction/training on the application of the standards for planning, designing and contract work preparation and supervision including quality control;
- **Consultants and contractors** working in the road sector require introduction to LVRR Standards and respective specifications, contract work implementation (work methods), plus quality control measures;

- **Politicians and decision makers** need to be aware of the general parameters of LVRR Standards and specifically of the consequences in terms of service levels to be expected, funds involved and maintenance requirements;
- **VMC and communities** in general need to be well informed about the general parameters of LVRR Standards and specifically of the consequences in terms of service levels to be expected, setting priorities, funds involved and maintenance performance requirements;
- **NUOL, other universities and technical colleges:** lecturers need to be introduced to LVRR Standards and their consequences in terms of planning, designing, work methods, funding requirements plus research requirements.

### 3.2.6 Concluding the Capacity Assessment



### 3.3. LVRR Standards and Training Modules for Mainstreaming

In accordance with the TOR and the subsequent reports the SEACAP-3 project will deliver the following documents relating to LVRR Standards:

#### A.) Standards and Specifications:

- Document 1: LVRR Classification and Geometric Standards
- Document 2: LVRR Technical Specifications
- Document 3: Background and Guidance on the application of Documents 1 and 2.

#### B.) Training Material (consisting of):

- Module 1; LVRR Background
- Module 2; LVRR Environment
- Module 3; LVRR Design Process

- Module 4; LVRR Design in Practice
- Lecturers' Notes and sets of Power Point Presentations

These 'formal' documents may be supplemented with one or two brochures for awareness creation and information purposes.

### 3.4. Challenges and Opportunities for Mainstreaming the SEACAP-3 LVRR Standards

The **main challenges** that will be envisaged in trying to mainstream LVRRS within the SC-3 project are:

- The SC-3 **project duration** of one year is insufficient to allow for a full and effective dissemination process in all concerned sectors and levels.
- Achieving **acceptance** of new standards that might limit certain interests; for example it may take some time to convince all concerned of the need for spot improvement versus full length construction,
- The existing limited **implementation capacity** is likely to require a complex dissemination and learning process.
- A well tailored, managed and funded institutionalised **research** and associated mainstreaming capability is not secured but is a necessity for sustainability,
- **LVRR Standards** have not been fully **tested** in the context of the Laos environment and are therefore to some extent on trial. In other words long-term experience in applying these standards both in designing and carrying out roadworks is missing.

On the other hand, there are a number of **opportunities** that should be considered for further perusal of the dissemination and mainstreaming process:

- There is an apparent **willingness** from many stakeholders to deal with the challenges and make changes for the benefit of achieving the set goals for poverty reduction.
- There is now a **common understanding** amongst government departments and support agencies that providing access is an issue, which requires appropriate local resource-based solutions. The SC-3 results will support this and further facilitate the process of finding tailor-made solutions for the Laos road infrastructure sector.
- The long-term involvement of the LSRSP and other support projects has prepared a **sound basis** for further developments.
- The **Basic Access Component** of the LSRSP provides an excellent platform for dissemination, training and mainstreaming of SC 3 outputs in 26 of the poorest districts until 2009 when the project will come to an end.
- **NUOL is keen** in absorbing new locally-based engineering solutions and practices as well as playing a key-role in implementing research.
- Although GoL is trying to reduce the number of civil servants, MCTPC have been given the authority to **employ additional engineers** to ensure all currently vacant positions within LRD, DCTPCs, and OCPTCs are filled with qualified personnel by the end of 2010. Hence their capacity in terms of numbers should be achieved.

## 4. Prerequisites for Effective Dissemination and Sustainable Mainstreaming

### 4.1. Requirements for Sustainable HRD Capacity

As mentioned before (see Section 2), HRD is the most important means for effective dissemination and mainstreaming. In order to create an effective HRD capacity, there are a number of crucial requirements, such as:

- Development of a comprehensive HRD Plan for all involved government departments,



- Establishment and regular update of a training needs analysis for the private sector,
- Establishment of a strong and permanent capacity for training management,
- Creation of an adaptable training delivery capacity and training approach to respond to the changing training requirements (market oriented, responsive to reforms),
- The actual training to be delivered by specialised training suppliers (institutions, experts) to ensure full professionalism,
- Effective co-ordination of all training related matters among all relevant stakeholders,
- Co-ordinated and “streamlined” training material development by efficiently accessing best-practice knowledge,
- Integration (mainstreaming) of important subjects to the curricula of educational institutions, such as universities and polytechnics,
- Established and enforced training standards and accreditation procedures,
- Development and operation of effective training planning, evaluation and monitoring systems,
- Adequate and reliable funding mechanisms,
- Long-term development support.

Only if these requirements are met, can good quality HRD with a national impact be expected that can significantly contribute to:

- Poverty reduction efforts by the Government,
- Mainstreaming of appropriate technology (in the case of SC-3 outputs) for infrastructure provision,
- Enhanced knowledge, skill and management competencies in the construction sector, both in the public and private sector,
- Appropriate institutional strengthening to enable delivery road sector responsibilities, and
- Professional development of all personnel involved in road infrastructure work and therefore enhanced career / employment / business opportunities.

#### 4.2. Enabling Environment

An enabling environment is the core prerequisite for achieving a **sustainable long-term HRD impact** and a consequent improvement in the execution of road works.

Roadworks comprise of a wide range of activities and products (planning, design, procurement, work implementation, supervision), which are delivered or produced by different work partners (departments, consultants, contractors, suppliers, banks, other service providers). In order to ensure effective and efficient co-operation by all parties to meet the set targets a rather complex system of relationships, contractual agreements and management issues has to be established. This is only possible through an enabling environment, relevant regulatory measures, operational procedures, guidelines and laws that are enforced.

People require a set of competencies to perform effectively in their job, which are usually acquired through training and experience. However, in order to bring about an adequate and sustainable performance capacity a number of

##### Requirements for enabling environment in the construction sector:

- Political goodwill and supporting policies,
- Defined and established roles and organisation structures for implementing agencies coupled with functional HRD systems,
- Adequate implementation capacity at national, provincial and local levels,
- Appropriate road network management capacity developed,
- Road maintenance management system developed and established,
- Technical specifications and guidelines for local resource based road works developed and available,
- Costing norms and procedures developed and available,
- Appropriate procedures for registering and classifying contractors established\*
- Procedures for selecting / short listing contractors established,
- Procedures for tendering, contract award, certification and payment established,
- Appropriate contract documentation developed, available and in use by all parties,
- Regular flow of funding and streamlined disbursement and administration procedures,
- Quality control measures developed and adopted,
- Accountability.

preconditions have to be met that have little to do with training.

These preconditions have to be pursued parallel to the actual capacity building process and are, as such, absolutely essential if the set objectives are to be achieved.

Many of the prerequisites are usually of procedural and technical nature and are consequently also a direct input to the training programme, e.g. procedural and technical manuals, management guidelines, etc.

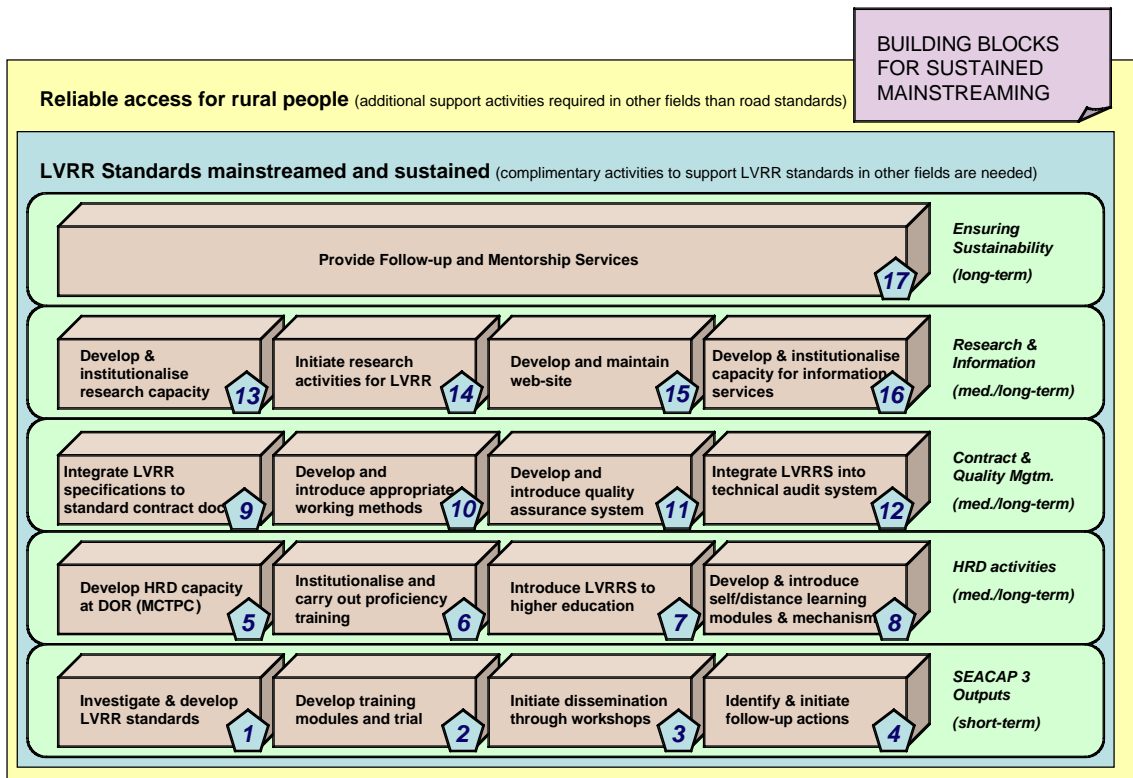
It goes beyond the scope of this paper to exactly determine the status of all the requirements in the Lao construction sector as listed in the box. However, it may be said, with some certainty, that many of these issues are not yet fully developed, introduced and applied and therefore limitations with respect to HRD effectiveness and impact have to be accepted.

## 5. Strategy Options

### 5.1. Strategy Overview

Based on the above analysis this paper recommends the pursuit of a strategy that realistically ensures a sustainable dissemination and mainstreaming process through a well-developed human resource development approach together with additional support mechanisms, such as information and advisory services. Research is also treated as an integral part of this strategy in order to ensure complementary results and transference to practice. This requires a concerted approach involving all the relevant partners by using all appropriate mechanisms and ensuring that the process is fully institutionalised at the national level.

Pursuing a strategy that involves numerous partners over a prolonged period of time is a dynamic process with many unknown or uncertain factors that may or may not play a future role. The development approach has to take note of this situation and cannot be rigidly planned but has to be



flexible and process-driven. Consequently the approach has to be multi-dimensional in terms of time frame and activities. A “building block system” of independent but complementary activities and measures may be best suited for this situation. All building blocks together form a total development concept. The advantage of using such an approach is that it will be flexible enough to change or complement building blocks to address changing requirements and support opportunities at a later stage.

Although the emphasis in this paper and in this section in particular is on the mainstreaming of the SEACAP 3 LVRR Standards and Specifications, the principals also hold true for the other related SEACAP projects; namely Pavement Trials (SC17) and Slope Stabilisation (SC21). Together these three projects form a rural road related package whose medium to long term dissemination and mainstreaming into practice should ideally be very closely co-ordinated.

<b>Activities and Measures: “Building-Blocks to Ensure Sustainability”</b>		
<b>Areas</b>	<b>Activities (Building Blocks)</b>	<b>Description</b>
<b>SEACAP-3 Outputs</b> (short-term)	1. Investigate and develop LVRR standards	Specific standards for the purpose of LVRRs in Laos are being developed and documented. The LVRR documents cover classification, geometric design, pavement design, technical specification, principal drainage guidelines plus design process commentary.
	2. Develop training modules and trial them	A set of 5 Training Modules covering LVRR background, environment, design process, and design practice. A separate trainer guide and sets of Power Point presentations complement the modules. The material will be tested in a pilot course with a mix of participants from DCTPCs, OCTPCs, LRD, NUOL, TCTI.
	3. Initiate dissemination through workshops	A special dissemination workshop will be organised to inform relevant partners about the new LVRR standards. The LVRR documentation will also be made available through a web site.
	4. Identify and initiate follow-up actions	Besides the required activities under SC-3 additional actions will be required to ensure continuation of the dissemination process. Some of the issue are further elaborated in Section 6 of this report.
<b>HRD Activities</b> (medium / long-term)	5. Develop HRD capacity at DOR (MCTPC)	In accordance with the analysis in this study, HRD is the main means for sustainable mainstreaming of the LVRR research. The basis for this is an effective capacity to manage HRD issues. Besides being able to manage HRD, it will be fundamental to have a well-developed capacity to provide training for the entire construction sector (government staff, consultants and contractors). Details of a possible approach are described in Section 5.2.
	6. Institutionalise and carry out proficiency training	
	7. Introduce LVRR Standards to higher education	The existing curricula for degree and diploma courses at the three universities, but mainly NUOL, and technical colleges have to be reviewed with the aim of integrating the new Standards. Appropriate training material has to be introduced/updated and practical projects organised. At the same time the lecturing staff needs to be orientated and practical attachments to ongoing projects dealing with LVRR organised
	8. Develop & introduce self/distance learning modules & mechanism	Self and/or distance learning is potentially a very effective means for disseminating LVRR research and relevant work processes. However, it would have to be linked to an accredited proficiency training system to ensure interest and results. Appropriate modules and an internet-based learning-system developed. This may be linked with Building Block 15.

<b>Contract &amp; Quality Assurance Management</b> (medium / long-term)	9. Integrate LVRR specifications to standard contract doc.	One of the challenges in adopting the LVRR research is to ensure that specifications are adhered to when it comes to carrying out contract works. Overall integration of these specifications into all contract documentation of all projects (ideally in standardised documentation) is essential. Compliance with the specifications depends then on good supervision and effective quality control (→ see also “Building Block” 11).
	10. Develop and introduce appropriate working methods	The LVRR documents are not only a set of standards with specifications; they have also an effect on work methods. The specifications and design approach are also meant to reflect a local resource-based technology and therefore need to be tailored to accommodate locally available materials, knowledge and skills, contractors, etc. Consequently, work methods will differ from conventional civil engineering work practices to some extent. These methods have to be developed, tested and trained along side with the standards and specifications. Issues that require particular attention are, earthworks, compaction and pavement activities.
	11. Develop and introduce a quality assurance system	New standards and specifications will only be useful if they are also adhered to. A well-established quality assurance system that encompasses the entire project cycle is mandatory to ensure sustainable mainstreaming of LVRRS and specifications. External and unbiased technical auditing, possibly coupled with public auditing, is equally important to ensure overall compliance.
	12. Integrate LVRRS into technical audit system	
<b>Research and Information Services</b> (medium / long-term)	13. Develop & institutionalise research capacity	The establishment of a locally institutionalised research capacity is an essential prerequisite for continued research on LVRR issues in particular and other civil engineering aspects in general. Developing an affordable and sustainable strategy for attaining the necessary road research is one of the three expected key outcomes of SC-3. For this reason a more detailed potential approach is described in Section 5.2 below.
	14. Initiate and implement research activities for LVRR	Mechanisms have to be developed to identify, fund and implement research as well as ensuring transference of results to operational levels. As above, details on this are described in Section 5.4 below.
	15. Develop and maintain web-site	The internet has become a powerful information dissemination medium. SC-3 has therefore already investigated the potential for a project website which would allow internet users to access the available LVRR documentation (→ see SC-3 Report “Website Provision Recommendations”, Trevor Bradbury. TRL Ltd).
	16. Develop & institutionalise capacity for information services	It is recommended to link the information website with self-learning modules (see Building Block 8). It will be extremely important to find an appropriate “home” for the website / self-learning modules. Appropriate institutional arrangements should be made for this by (ideally) joining research, information, training, and advisory services (RITA) within one division (→ see more details in Section 5.2. below).
<b>Ensuring Sustainability</b> (long-term)	17. Provide Follow-up and Mentorship Services	Experience from <u>very</u> many projects around the world shows that sustained capacity building and effective mainstreaming can only be achieved if development support is granted over a prolonged period of time. This is best achieved through a dedicated mentorship programme that should also be part and parcel of RITA (→ see above and Section 5.2 below).

## 5.2. HRD and Research Capacity

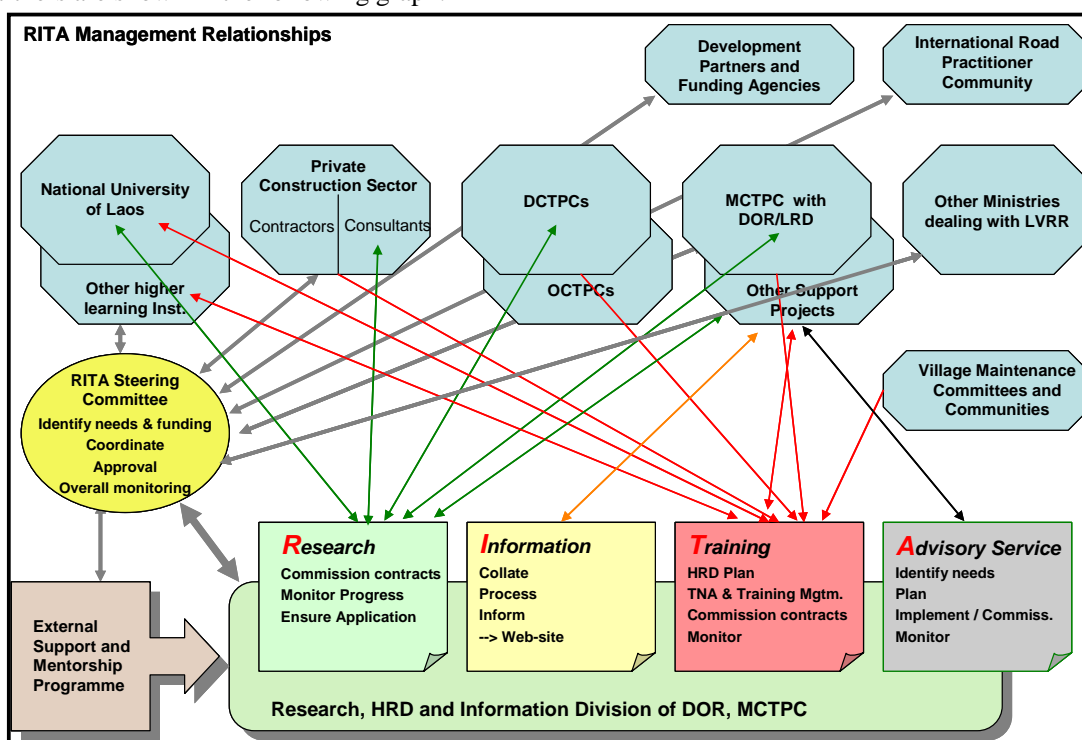
Currently discussions under the SC-3 project concerning a Research Strategy “A Framework to Address Knowledge Gaps and Sustain Current Initiatives” suggest the establishment of a separate Research Management Unit at DOR with representation of PTD, LRD & RAD and to be overseen by

a Steering Committee (MCTPC and NUOL). Research would then be carried out by NUOL with local field support from DCTPCs.

However, based on the analysis made in this report, research and HRD are closely related and have to complement each other. Research needs to be directly linked with training to ensure full integration and dissemination of results. This has to be supplemented with appropriate information and advisory services which support the effective application of results in the road sector industry. For this purpose a strong institutionalised and permanent HRD, research and information capacity is essential.

This paper therefore recommends that MCTPC creates within the Department of Roads a new Division for “Research, HRD and Information (RHI)”. Current responsibilities in terms of training coordination and research should be transferred from PAD and PTD to the new Division. A steering committee for research as identified through previous SC-3 discussions should be retained and its scope expanded to accommodate the additional functions of the RHI Division.

The overall functions of the RHI Division and the management relationships with the concerned partners are shown in the following graph.

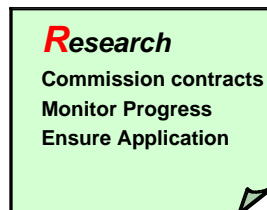
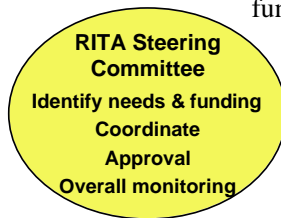


At this point it must be noted that the recommended institutional re-organisation and the resulting arrangements have not been discussed with the key stakeholders. and it is acknowledged that such a re-organisation would require careful consideration in terms of pros and cons as well as on the long-term impact. However, the report recommendations are based on extensive experiences from elsewhere and are therefore made with the strong belief that this would be a most effective arrangement.

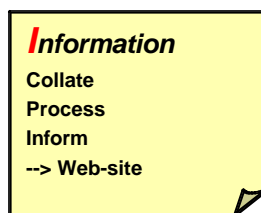
The new RHI Division would be charged with a number of functions in four main areas: Research Management, Information Services, Training Management and Advisory Services (RITA). It is the recommendation of this report that comprehensive effectiveness and sustainable results may only be achieved if these service and management areas are combined into one integrated operational unit.

The detailed RITA functions and relationships could be as follows,

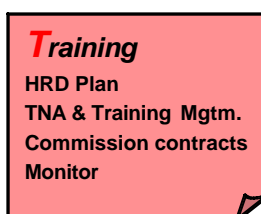
The RITA Steering Committee identifies research, training and information issues/needs as well as funding sources/mechanisms together with DOR/LRD, NUOL, the private construction sector, international development partners and possible other practitioners in the sector. The RITA SC approves projects and commissions RHI to manage these projects. SC also coordinates the various partners involved in such projects and maintains the role of an overall approval and monitoring capacity.



The RHI Division is charged with the management of research activities which comprises commissioning research works and monitoring the process and progress. After the research has produced usable results, these will then have to be mainstreamed through dissemination, training and providing advice on a demand basis. For this reasons RHI will mobilise its capacity in terms of managing training and providing information and advisory services as described below.



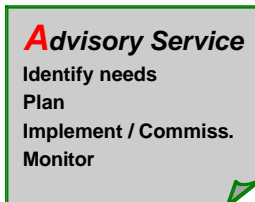
Information services comprises a number of possible means to disseminate valuable information from research, projects, innovations from the private sectors and any other useful information on road sector works. This information needs to be identified, collected and possibly processed for general or specific consumption. The dissemination of such information may be achieved using different mechanisms of which a dedicated rural road website might be the most effective way (see also details on building blocks 15 and 16 above). Other mechanisms are topic specific handouts, procedure manuals, training manuals, awareness creation material, etc. Videos, radio programmes, newspaper articles, contributions to Regional and International professional circles and learning institutions are further possibilities.



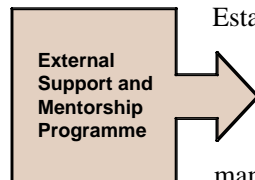
Training management, or in a wider sense HRD, is the core function of the RHI Division. It can of course be debated whether an overall HRD Plan should remain the responsibility of PAD while RHI would then manage the training only since HRD of a ministry also comprises of issues like career development, remuneration scales, promotion regulations and others. In any case training management would encompass a number of functions:

- Designing and planning of training programmes. This includes training needs assessments, development of curricula, resource plans, cost estimates;
- Identifying training provision and procuring training services from qualified training suppliers and preparing them for their task;
- Coordinating the training operations with all stakeholders and implementers;
- Supervising the execution of training services from the contracted training suppliers.
- Liaising with the private sector on training demands and opportunities to organise/implement training for private sector personnel;
- Formulating and ensuring training standards and qualification schemes;
- Developing and implementing a training quality assurance system;

- Being the custodian of all training related material and developing/updating it constantly;
- Preparing recommendations for a training accreditation system for the rural road infrastructure sector; i) for training suppliers that are not yet accredited but have the capacity to deliver the required training, and ii) for skill courses in areas that are essential in the provision of a sustainable rural road infrastructure but are not yet fully recognised, e.g. road construction contractors course. Therefore, close cooperation with the Ministry of Education is essential.



Advisory and mentorship services are complementary to the other services of RHI and ensure that information and training is supported with tailored interventions as and when required. Advisory services may not necessarily have to be provided for by the RHI staff but can be commissioned from experts. Various projects, which are funded by development partners offer TA services that could be utilised for a broader audience in the road infrastructure sector rather than strictly for the project only. Also international institutions and organisations may be approached for advice and support, e.g. ILO ASIST, IFRTD, SEACAP, etc. Coordination of such inputs to ensure maximum benefits will be a core function.



Establishing a new RHI division that has a rather complex portfolio of responsibilities and functions would probably require external support and mentorship provision over a longer period of time. This might start with a substantial support package at the beginning to establish the Division and would continue on a sliding scale over time. Overall development and management support would have to be coupled with tailored expert inputs. Such an arrangement could be part of one of the support programmes of funding agencies that have an interest in establishing a sustainable capacity building and mainstreaming capacity in the road sector in Lao.

## 6. Follow-up

The proposed strategy in this paper is relatively hypothetical and based on ideal assumptions. However, if the objective of achieving full mainstreaming of the SEACAP 3 and other research programmes is to be attained in conjunction with a sustainable research capacity then comprehensive measures such as those outlined in this paper, have to be taken.

It is therefore recommended that this paper is used as a basis for discussion on the way forward. Possible steps in this way forward are outlined below:

1. Discussion by the SEACAP 3 Steering Committee and other co-opted stakeholders on the recommendations within this paper
2. Presentation of combined TRL-Steering Committee recommendations in a workshop and in the SC3 final documentation
3. Comments from the workshop assessed and the final recommendations taken forward to the DoR and MCTPC
4. Implementation of an agreed strategy by the MCTPC

## Acknowledgements

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- Mick O'Connell (TRL, SC-3, Deputy Team Leader)
- Prof. Nhinaxay Visane (Head CED NUOL)
- Nils Gardek (LSRSP III, Basic Access, Associate Expert)
- Saysongkham Manodham (LTEC, SC-3, Senior Roads Engineer)
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- Simone Done (TRL, SC-3, Training Specialist)
- Souvanny Ratanavong (Deputy Director, Personnel Department, MCTPC)

Their contributions were provided readily and greatly facilitated the task of carrying out this assignment.

Andreas Beusch, October 2007

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To develop this paper, the following documentation has been used as reference material:

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# Annexes

## Annex I: Organisation Chart MCTPC

