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Development of National Business Plans for the Establishment of Road Research Units/Centres in AsCAP Member Countries

Inception Report

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Cover Photo: Rural road in Myanmar (Source: Asian Development Bank)

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Abstract

The Asia Community Access Partnership (AsCAP), funded by a grant from the UK Government through the Department for International Development (DFID), aims to promote safe and sustainable rural access in Asia through research and knowledge sharing between participating countries and the wider community.

Based on the outcomes of project scoping exercises undertaken in three AsCAP countries (Bangladesh, Myanmar and Nepal), the need for the establishment of road research capacity within the partner government departments was identified as a high priority in order to support and sustain research and knowledge management related to rural access.

To address the above need, AsCAP initiated a project to develop action/establishment plans supporting the needs of each country. These plans would address issues such as sustainable institutional arrangements, capacity building interventions and funding sources to support the road research centre or unit on an ongoing basis.

The Inception Report presents the results of interactions held with key stakeholders in Myanmar and Nepal during May 2017. The objectives of these interactions were to identify the specific needs and to gain an understanding of how the individual government departments would like to establish road research management capacity within their existing institutional frameworks.

The report also outlines a revised workplan to achieve the main objective, namely to develop business plans for the three countries, and secure their endorsement by Steering Committees established in those countries, so as to guide the partner government departments with the physical establishment of the research units/centres.

Key words

Capacity Building, Knowledge Management, Research & Development, Research Unit

ASIA COMMUNITY ACCESS PARTNERSHIP (AsCAP)

Safe and sustainable transport for rural communities

AsCAP is a research programme, funded by UK Aid, with the aim of promoting safe and sustainable transport for rural communities in Asia. The AsCAP partnership supports knowledge sharing between participating countries in order to enhance the uptake of low cost, proven solutions for rural access that maximise the use of local resources. AsCAP is brought together with the Africa Community Access Partnership (AfCAP) under the Research for Community Access Partnership (ReCAP), managed by Cardno Emerging Markets (UK) Ltd.

See www.afcap.org

Acronyms

AsCAP	Asia Community Access Partnership
ADB	Asian Development Bank
CSIR	Council for Scientific and Industrial Research
DDC	District Development Committee
DFID	Department for International Development
DOB	Department of Bridges
DOH	Department of Highways
DoLIDAR	Department of Local Infrastructure Development and Agricultural Roads
DoR	Department of Roads
DoTM	Department of Transport Management
DRD	Department of Rural Development
DTO	District Technical Office
ICT	Information and Communication Technology
IT	Information Technology
LBES	Labour-Based, Equipment Supported
LEP	Labour-based, Environmentally-friendly, Participatory approach
LGEB	Local Government Engineering Department
LRN	Local Road Network
LRUC	Local Road User Committees
LTRD	Local Transport Research Division
MES	Myanmar Engineering Society
MTU	Mandalay Technological University
MOALI	Ministry of Agriculture, Livestock and Irrigation
MOBA	Ministry of Border Affairs
MOC	Ministry of Construction
MoFALD	Ministry of Federal Affairs and Local Development
MoLD	Ministry of Local Development (replaced by MoFALD)
MoPPW	Ministry of Physical Planning and Works
MoSTE	Ministry of Science, Technology and the Environment
MOTC	Ministry of Transport and Communications
NAST	Nepal Academy of Science and Technology
R&D	Research and Development
RBN	Roads Board Nepal
RDU	Research and Development Unit
ReCAP	Research for Community Access Partnership
RRRTC	Rural Road Research Technical Committee
RRTC	Road Research Technical Committee
SDC	Swiss Agency for Development and Cooperation
SRN	Strategic Road Network
VDC	Village Development Committee
YTU	Yangon Technological University

Contents

1. Executive Summary

The Asia Community Access Partnership (AsCAP), funded by a grant from the UK Government through the Department for International Development (DFID), aims to promote safe and sustainable rural access in Asia through research and knowledge sharing between participating countries and the wider community.

Based on the outcomes of project scoping exercises undertaken in three AsCAP countries (Bangladesh, Myanmar and Nepal), the need for the establishment of road research capacity within the partner government departments was identified as a high priority in order to support and sustain research and knowledge management related to rural access.

To address the above need, AsCAP initiated a project to develop action/establishment plans supporting the needs of each country. These plans would address issues such as sustainable institutional arrangements, capacity building interventions and funding sources to support the road research centre or unit on an ongoing basis.

In this report, the results of interactions held with key stakeholders in Myanmar and Nepal during May 2017 are presented. The objectives of these interactions were to identify the specific needs and to gain an understanding of how the individual government departments would like to establish road research management capacity within their existing institutional frameworks.

The report also outlines a revised workplan to achieve the main objective, namely to develop business plans for the three countries, and secure their endorsement by Steering Committees established in those countries, so as to guide the partner government departments with the physical establishment of the research units/centres.

2. Background

The background to this project is provided in the Terms of Reference:

As part of the project scoping exercises undertaken in the three established AsCAP countries (Bangladesh, Myanmar and Nepal), in all cases the need for some form of road research capacity within the partner government departments was identified as a high priority and a major constraint to the sustainable management of research and knowledge management related to rural access.

While the detailed needs for establishment of road research capacity will be different in each country, there will be many common areas that will be relevant to all that could be undertaken as a regional AsCAP project.

This project should be seen as an establishment phase to develop detailed actions and establishments plans based on the needs of the individual countries. As part of the action plan for establishment, sustainable institutional arrangements, capacity building interventions and funding will need to be identified to support the road research centre or unit on an ongoing basis.

The overall aim of the project is to develop detailed establishment plans, modes of operation and indicative budgets for individual AsCAP countries in line with their needs for the sustainable management of research related to rural access.

The key impacted groups will be the national government departments responsible for the provision and management of rural infrastructure in the respective AsCAP member countries.

3. Objectives

The overall objective is to support the building of indigenous road research capacity in Bangladesh, Nepal and Myanmar. The need for the establishment road research capacity within the government departments of the three countries was identified as a high priority, also to address current

constraints associated with the management of research and knowledge management related to rural access in these countries.

In order to address this need, the establishment of a road research unit/centre in each of the three countries would be required.

The objectives of this project are to:

(1) Identify specific needs and gain understanding of the individual countries' expectations with respect to the development of road research management capacity within their institutional frameworks;

(2) Based on feedback obtained from (1), identify, propose and reach agreement on institutional arrangements and structures to support the entrenchment of such capacity in the three countries (i.e. establishment of rural road research units/centres);

(3) Develop national business plan for the establishment of research capacity in line with the above outcomes, inclusive of sustainable institutional arrangements, modes of operation, capacity building interventions and funding (indicative budgets).

The project is to be conducted over a 24 week period and is expected to include three visits to each country. Throughout the duration of the project the Service Provider will maintain close liaison with the project counterpart or counterparts to be designated by the respective government departments in the three countries. These are:

- *Bangladesh:* Local Government Engineering Department (LGED), Ministry of Local Government, Rural Development and Cooperatives
    - *Counterpart:* Monzur Sadeque
- *Myanmar:* Department of Rural Development (DRD), Ministry of Agriculture, Livestock and Irrigation, Myanmar
    - *Counterpart (DRD): Mr Sou Sou Oo*
    - *Counterpart (Cardno): Dr Nandar Oo*
- *Nepal:* Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR), Ministry of Federal Affairs and Local Development
    - *Counterpart: Mohan Chapagain*

4. Approach and Methodology

4.1 Generic approach and methodology (as per the Technical Proposal)

This section presents the details of the generic activities to be undertaken in order to produce the outputs which in turn will contribute to achieving the project outcome, namely the development of ***National Business Plans for the establishment of Road Research Units/Centres in Bangladesh, Myanmar and Nepal***.

The general approach that was proposed for the three countries in the Technical Proposal is outlined below. The approach has since been adapted for each country based on current realities. The general approach consisted of three tasks with a series of sub-tasks:

- Task 1: Inception and Management
- Task 2: Institutional aspects of the Business Plans
    - Governance
    - Sources of funding
    - Location of the Road Research Units/Centres
    - Partnerships and networking

- Task 3: Capacity aspects of the Business Plan
    - Human resources
    - Research infrastructure

The activities planned to be undertaken in each of the tasks and subtasks are presented in Annex A

4.2 Adapted approach and methodology for Myanmar

The generic approach and methodology outlined in Section 3.1 and Annex A had to be modified for Myanmar for reason that the official kick-off meeting with the Director General of the Department of Rural Development (DRD) and his team could only be held on Friday, 26th of May 2017 [visit to Myanmar was planned between 24 and 26 May]. However, the Consultant managed to organise a pre-meeting with the Director of Rural Roads in DRD, Daw Tin Moe Myint, on 25 May, which proved to be very useful.

At this pre-meeting the urgency of establishing a research and development unit was highlighted, especially within the context that DRD might undergo structural changes within four to five months. Hence, the urgency to develop a Business Plan for the establishment of a Research and Development Unit, and the establishment of the Unit itself, were identified as a key priority.

In view of the above, Myanmar was rated as a priority country for the formal embedment of research capacity in the existing institutional structures of DRD or, more likely, in a new institutional structure under MOC, The Consultant revised his work programme accordingly, fast-tracking the development of a formal Business Plan for the establishing of research capacity in Myanmar. DRD requested a first-level business plan to be prepared by early June 2017, for in-country deliberation during the last two weeks of June 2017.

4.3 Adapted approach and methodology for Nepal

The generic approach and methodology also had to be adapted for Nepal. The country is in the process of moving from a Unitarian to a Federal government. This bring into question the role of the Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR) within a federal government structure, especially since DoLIDAR was mandated to undertake infrastructure development programmes to (inter alia) make *local authorities* technically capable and competent. These local authorities will now be integrated in provincial and municipal structures.

It was confirmed by the Ministry of Federal Affairs and Local Development (MoFALD) that DoLIDAR will continue to exist in one form or another. DoLIDAR may become a technical support agency for both the provincial and municipal governments. Hence, it was considered urgent to establish a local transport research unit providing scientific, engineering and technological leadership in order to attain a network of good quality and safe local roads in Nepal.

DoLIDAR requested the Consultant to develop a first-level business plan for the establishment of this unit by the end-June/early-July 2017.

4.4 Adapted approach and methodology for Bangladesh

The visit to Bangladesh that was planned originally for the week of 21 May 2017 had to be postponed for a number of reasons outside the control of the Consultant.

Since June is the month of Ramadan, the Consultant requested that the inception meeting, combined with the two-week in-country visit, be arranged for the weeks of 16 and 23 July. The proposed dates are still to be confirmed by Bangladesh.

5. Deliverables

The project deliverables will be as follows:

- Inception Report: 26 June 2017
- Interim Progress Report: 21 August 2017
- Draft Report: 18 September 2017
- Final Report: 16 October 2017

The Final Report will also provide recommendations on any further ReCAP/AsCAP support and/or possible support from other stakeholders (including other donor support) required in the short to medium term.

In addition to the above, interim Business Plans for the establishment of research capacity in the three countries will be circulated to ReCAP for their approval before being submitted to the countries.

6. Progress to date

6.1 Proceeding of meetings held in Myanmar

6.1.1 Meeting held on 25 May 2017 (09:15 to 12:00)

The meeting was attended by Director Daw Tin Moe Myint, Mr Soe Soe Oo, Dr Nandar Oo and the Consultant.

After a brief introduction, the project's purpose, scope, deliverables and timeline were discussed and agreements were reached, as outlined below:

- It was agreed that the Counterpart Staff for the project will be:
  - for DRD: Mr Soe Soe Oo
  - for Cardno: Dr Nandar Oo (as per the request of DRD)
- A general overview of the AsCAP Report on Myanmar (August 2016), inclusive of the listed research and development priorities contained in this report, as well as the scope of the Memorandum of Understanding signed between Myanmar and AsCAP, were discussed. With respect to the latter, the following four areas of cooperation between Myanmar and AsCAP were highlighted:
  - Development of appropriate standards and specifications for rural access roads;
  - Establishment of a rural road Research and Development Unit (RDU);
  - Myanmar's participation in regional projects;
  - Myanmar's participation in international meetings; and
  - Myanmar's participation in regional (AsCAP) meetings.
- In terms of research activities, Daw Tin Moe Myint expressed particular interest in:
  - The cost-effective use of local materials;
  - Climate-resilient solutions for rural access;
  - Establishment and/or monitoring of trial sections in three focus areas (i.e. delta, hilly and central dry zones) and the development of appropriate standards;
  - Capacity building of staff.
- The scope of the RDU is to be limited to addressing rural roads (i.e. not all roads). Also, the scope should not be limited to the management of R&D, but also the execution thereof.
- Institutionally, the RDU will be established in the Rural Road & Bridge Division of DRD, unless advised otherwise. As for the physical location of the RDU, it could initially be established in Yangon where it could access the laboratories of either or both MOC and the university. It

was noted that the DRD currently only has a mobile laboratory. In future, there is the possibility that the RDU could be re-established in Nay Pyi Taw. This would depend on the willingness of the German Development Bank (or other Development Partners) to support the establishment of a laboratory. As a consequence of the above, the initial scope of work to be conducted by researchers of the RDU might be limited to "desktop" or field monitoring studies – this should be taken into consideration in the design of the RDU's R&D programme.

- It was proposed that a Road Research Technical Committee be established. There is currently no such committee in place. The composition of this Committee could consist of technical experts from:
    - DRD, the Ministry of Border Affairs (MOBA), Department of Highways (DOH) and Department of Bridges (DOB) under the Ministry of Construction (MOC), MOTC, universities (YTU & MTU), Myanmar Engineering Society (MES);
    - Other organisations, such as the Ministry of Water Affairs, could be invited at a later stage, when the need arises;
    - The participation of contractors and material suppliers was discussed. At present there is no federation or association of contractors in Myanmar. Hence, four to five representatives of contractor organisations could be invited;
    - With respect to universities, it was proposed that heads of civil engineering departments (as well as a retired well-respected senior experts) be invited;
    - Development Partners could be invited as observers;
    - It was noted that at a lead-up time of at least two weeks would be required to invite individuals to become members of the committee and to invite them to a meeting of the Technical Committee.
- It was also proposed that a Steering Committee be established to guide the establishment of the RDU, among other functions. The membership of this Committee should consist of senior members representing Ministries and other organisations that deal with aspects of rural roads and rural accessibility. The Consultant was informed that it might be difficult to establish such an inter-Ministerial committee and that one should rather make use of an existing committee. The *Regional Road and Bridge Development Committee* was proposed. The policy, strategic objectives and current action plan of this Committee is as follows:
    - *Policy:* Improvement of socio-economic life of people through development of rural roads and bridges
    - *Strategic Objectives:*
        - sustainable rural development;
        - smooth transportation for local products to markets;
        - development of rural road network for better access to education, health and social services; and
        - increase quantity of all-weather rural roads by two per cent by annum.
    - Current *Action Plan:*
        - to collect rural road and bridge inventory and data;
        - to conduct local and international training, meetings, workshops and research;
        - to develop road inventory map and core network plan;
        - to identify road category, class, design and priority;
        - to develop the priority road network and workplan for the 2017/18 to 2020/21 fiscal year; and

        - to develop a rural road investment plan for 2017/18 to 2030/31 fiscal year with national and international assistance.
- The Consultant was provided with an extract of the *National Strategy for Rural Roads and Access* (2017) indicating that three multi-ministerial committees were created in 2016, namely:
    - a Regional Road & Bridge Steering Committee
    - a Regional Road & Bridge Implementation Committee
    - a Regional Road & Bridge Supervision Committee
- The Consultant requested an electronic copy of above document which was received in the afternoon of 25 May, and subsequently studied in preparation of the formal Inception Meeting to be held the following day.
- Finally, it was noted that no technical workshops or seminars dedicated to (rural) roads are being held in Myanmar. The importance of instituting these was acknowledged by DRD.

6.1.2 Meeting held on 26 May 2017 (10:00 to 11:00)

The meeting was attended by the Deputy Director General, Mr Myint Oo, Director Daw Tin Moe Myint, Mr Soe Soe Oo, Mr Dr Tun Myint Aung, Dr Nandar Oo and the Consultant. The Director General of DRD, Mr Khant Zaw, tendered his apologies.

The discussions were structured around a Powerpoint presentation prepared by the Consultant (cf. Annex B). The following outcomes were achieved:

- Support secured for the proposed objectives of the RDU, these being:
    - The development, application and dissemination of cost-effective technologies and resilient solutions for rural roads based on the use of local resources and materials;
    - The management and execution of research activities; and
    - Material testing and supporting quality.

  The above objectives were based on the objectives outlined in the *National Strategy for Rural Roads and Access* (2017) in which the following is stated:
    - *DRD in collaboration with MOBA will set up a research and development unit that will be responsible for material testing, supporting quality control, and developing and trialing new standards. Laboratories will be set up and proper procedures will be developed for material testing, quality control and trialing of new standards. Development partners will be requested to support the setting up of the laboratories and the development of procedures, to assist in the trialing and development of new standards, and to build the capacity of DRD and MOBA staff.*
- Support securing for the proposed programme of the Consultant – the need to fast-track the development of the Business Plan for the RDU was emphasized in view of the possible migration of the rural road development division of DRD to MOC;
- Support secured for the proposed layout of the Business Plan;
- Support secured for the establishment of a Road Research Technical Committee, but it was noted that contractors should not be invited at this stage – DRD is to hold a separate meeting with them. The following were noted:
    - Possible universities to be invited or consulted independently include Yangon Institute of Technology (member), Mandalay Institute of Technology (member), Taunggyi Technological University (consulted), Pathein Technological University (consulted), and H.E. Sayar Gyi U Nyi Hla Nge (member or consulted)
- Support the proposal made by the Consultant to use the *Regional Road and Bridge Implementation Committee* as the "Steering Committee" for reason that this Committee is

responsible for preparing rural road standards, for quality control of rural road works, for coordinating and facilitating land acquisition, and for preparing progress reports regarding the rural road sector indicators.

- The need to include the *Road Research Unit* as a topic on the agenda of the meetings of the Regional Road and Bridge Implementation Committee was acknowledged.

6.1.3 Progress made since meetings held in May 2017

As was agreed at the meeting held on 26 May 2017, the Consultant prepared a preliminary Business Plan (submitted to 9 June 2017 to Dr Nandar Oo) to be used as a discussion document for the two-week interactions with DRD and other stakeholders to be held between 19 and 30 June 2017. This preliminary Business Plan was also submitted to ReCAP for information.

In preparation of the Road Research Technical Committee meeting to be held during the week of 26 June 2017, the Consultant drafted a concept invitation letter addressed to the members of the technical committee, which was subsequently translated into Burmese by Dr Nandar Oo. The English version of the letter, which also contains the proposed agenda for the inaugural meeting of the Road Research Technical Committee, is appended as Annex C.

On 17 June, the day prior to the departure of the Consultant to Myanmar for the two-week interaction, the Consultant was informed that the intended move of the Rural Road and Bridge Division of DRD to MOC was confidential at this stage, and that the draft Business Plan (discussion document) should be redrafted on the basis that the research unit would be established in DRD under the Ministry of Agriculture, Livestock and Irrigation (MOALI). These changes were effected and a new draft was sent to Dr Nandar Oo on the same day.

Feedback on the meetings held with DRD during the week of 19 June 2017 will be reported in the progress report. However, some of the most important issues are listed below:

- It became apparent that the translation of the business plan in Burmese is essential in order for DRD and other stakeholders to comment meaningfully on the content of the Plan. Following discussions with ReCAP, it was agreed that two quotations should be obtained. This is being arranged by DRD.
- Following internal discussions within DRD, it was noted that the *Regional Road and Bridge Implementation Committee* is not a viable proposition to serve as the steering committee for the RDU. DRD will establish a new steering committee to oversee the establishment and operations of the RDU. The membership of this steering committee will be as described in the draft business plan. The following:
    - The Chairperson of the *Rural Road Research Technical Committee* (new title; RRRTC) will be a member of the Steering Committee;
    - The Steering Committee will be chaired by the Director General of DRD;
    - The Chairperson of the Steering Committee, who is also a member of the *Regional Road and Bridge Implementation Committee* will inform this Committee on matters pertaining to the RDU.
- The first meeting of the RRRTC will be held on 27 June 2017 at the offices of DRD in Nay Pyi Taw. The Consulted prepared presentations to facilitate and steer discussions. From the Consultant's perspective, the most important outcome of this meeting will be a list of prioritised research needs that will: support the development of a rural road strategic research plan; inform the resources required for the establishment of the RDU (research

capacity and research infrastructure); and support the drafting of an indicative budget for the RDU.

- Meetings will be held with MOC and the Yangon Institute of Technology on 28 and 29 June 2017 in order to (inter alia) assess their laboratories. However, it was noted by DRD that it is unlikely that these facilities will be able to support the research agenda of the RDU for the following reasons:
    - DRD has no offices in Yangon. Hence, the RDU will have to be established in Nay Pyi Taw, and
    - Both these laboratories are already fully committed.

  Based on the above, DRD recommended that the DRD Mobile Laboratory and/or government-approved private laboratories be used initially until the RDU has established its own research capacity.

In view of the fact that the RRRTC meeting will be held on 27 June 2017, followed by two days of meetings on 28 and 29 June 2017, it is expected that the second draft of the business plan will only be ready by Friday, 7 July 2017.

6.2 Proceeding of meetings held in Nepal

6.2.1 Preparatory work by the Consultant prior to visit

Based on documents made available to the Consultant, the following research needs were identified (and *updated* following a pre-meeting held with Dr Chandra Shrestha on 28 May 2017, as indicated below):

- Crossing structures (bridges)
    - Develop and endorse appropriate standards and norms for LRN bridges
    - *Update*: focus on modular pre-stressed structural elements
- Drainage systems
- Erosion control / slope stability
    - *Update:* apparently this seems to be under control
    - *Update:* seemingly uncontrolled material mining (aggregate and river sand) results in undermining/scouring of (bridge) structures
- Vehicle overloading management and enforcement
    - *Update:* vehicle overloading is uncontrolled on especially low-volume roads
    - *Update:* design roads/structures for prevailing needs of users (may be unaffordable) or enforce stricter control
- Climate resilient roads & bridges
- Appropriate norms and standards for roads and bridges
- Maintenance: capacity building (a key issue)
- Quality control/assurance (a key issue)
    - *Update:* Central & district laboratories – no inter-laboratory testing/calibration and no laboratory proficiency scheme
    - *Update:* Sending samples to DOR laboratory seen as punitive
- Black spot identification / improvement
    - Regularly carry out a detailed analysis of accident data to determine the types and causes of accidents in rural roads with the aim of developing targeted solutions to the most common types of accidents and identifying possible black spots
- Dust suppressants.

The above list of research needs would form a good basis for discussion with DoLIDAR and other stakeholders.

6.2.2 Meeting held on 28 May 2017 (18:00 to 19:00)

A pre-meeting was held between Dr Chandra Shrestha and the Consultant shortly after the Consultant's arrival in Kathmandu. The following information was shared and issues debated:

- The following potential options for the establishment of the research unit were suggested:
    - Establishment of the research unit under DoLIDAR, with the following two options:
        - Management of R&D in-house and execution of R&D by outsourcing, or
        - Management and execution of R&D in-house.
    - Potentially outsourcing the research unit as stand-alone research entity (possibly after an incubation period in DoLIDAR or other custodian);
    - Establishment of the research unit at the Institute of Engineering (University);
    - Establishment of the research unit at the Department of Roads (DoR) under their Planning & Design Branch; historically they used to operate a research unit and they currently have an established laboratory;
    - As a new entity under the Ministry of Science & Technology.
- It was reported that Nepal will become a federal state which may impact on the future of DoLIDAR and, by association, on the sustainability of the research unit if established under DoLIDAR. Since sustainability is key, DoR might be a better option?
- The scope of the research activities of the research unit will depend on the institutional location of the unit. For instance, under DoLIDAR the scope will be limited to local (low-volume) roads, but could comprise all roads if located under DoR. Whether its scope should be limited to roads only or should also include transport will have to be defined.
- Dr Shrestha provided and overview of the category of roads (organisations responsible for those are indicated in brackets):
    - Strategic Road Network (SRN – responsibility of DoR)
        - Main highways
        - Feeder roads
    - Local Road Network (LRN; rural & urban roads – technical assistance and coordination provided by DoLIDAR)
        - Urban roads (Municipalities)
        - Rural Roads (30,000 to 40,000km of which 18,000km are motorable)
            - District roads (classified as Class RRA) (District Development Committees (DDCs))
            - Agricultural roads (somewhat between district and village roads – DDCs)
            - Village roads (Standards Class RRB) (Village Development Committees (VDCc))
- With respect to norms and standards for infrastructure it was noted that:
        - Norms are developed by multi-Ministerial committees involved in infrastructure; and
        - DoR is the custodian for standards – standards developed by DoLIDAR always involves DoR (and other stakeholders where appropriate).

6.2.3 Meetings held on 29 May 2017

Monday, 29 May 2017 was declared a public holiday. The Consultant spent the morning studying and summarising the report *Nepal Road Sector Assessment Study* (December 2012) received from Dr Shrestha. This document provides valuable insights on some of the main issues that have affected or impacted on the road sector. A summary of the notes made by the Consultant are provided in Annex D. It also contains a list of potential (additional) research areas extracted from this Report.

6.2.3.1 Meeting with Dr Chandra Shrestha (13:15 to 15:45)

After a brief review of the notes on the meeting held on 28 May (for correctness), Dr Shrestha informed the Consultant about the changing political landscape of Nepal, i.e. its transition from a Unitarian State to a Federal State. The new government structure will consist of:

- a Federal government
- a Provincial government (7 provinces): Ministers and cabinet
- a Municipal government / village councils (Districts will be phased out)

The previous 3915 villages will be consolidated in approximately 264 municipalities (4 metros [to be increased to 6], 13 sub-metros, 247 local municipalities). This will impact on road classification and ownership:

- DoR will remain responsible for main highways and feeder roads (i.e. Strategic Road Network);
- New Provinces will most likely become responsible for main (previously) district roads;
- Municipalities will most likely become responsible for all other roads located within municipal boundaries.

Other interesting information shared by Dr Shrestha included:

- Budgets will be delegated directly to Provinces and Municipalities (note: the Road Fund Board (RBN) only dispenses funding based on predefined rules; the RBN does not manage funding and expenditure);
- All Ministries at state level (and their associated Departments) will be reviewed/redefined/ restructured (note: new role of DoLIDAR within the new government structure is as yet undefined);
- All changes in government structures need to be fully implemented by 1 January 2018;
- It was considered the opportune time to design/propose/implement a research unit since all Ministries and Departments are in process of being restructured.

6.2.3.2 Meeting with Mr. Ram Krishna Sapkota (Director General of DoLIDAR), Mr Mohan Chapagain (DoLIDAR) and Dr Chandra Shrestha (15:45 to 18:15)

The Consultant provided an overview of other R&D Centres, focusing on their institutional location, scope and status of development. The current situation in Mozambique, Tanzania, Namibia, Ethiopia, South Africa and Myanmar was presented.

Messrs Sapkota and Chapagain then shared their perspectives on the establishment of a research unit in Nepal:

- Mr Chapagain's perspective:
    - 70 per cent of DoLIDAR's focus is on local roads and 30% on other infrastructure such as irrigation and river control; water supply and sanitation; suspension bridges; housing and building; and rural energy)
    - His proposal for the research unit is as follows:

        - Establish one research unit within DoLIDAR focussing on local roads as well as on other infrastructure (i.e. similar to LoGITReC in Tanzania), or focus initially on roads and include the other infrastructure research units at a later stage;
        - Establish the research unit as a stand-alone entity that can sustain itself.
    - The uncertainty about the future of DoLIDAR was noted. There are various models:
        - one central DoLIDAR, or
        - seven "DoLIDARs" at Provincial level, or
        - a combination of the above.
    - He also noted that a downscaled DoLIDAR at central level would probably still be required for (for instance):
        - Donor management
        - Research and Development

- Mr Sapkota's perspective:
    - The Ministry of Federal Affairs and Local Development (MoFALD; previously MoLD) may remain in one form or another with Divisions managed by Permanent Secretaries at Federal level;
    - With Provincial and Municipal governments taking over much of the responsibilities of the previous central government, it is expected that departments at Federal level will be redefined and appropriately downscaled
    - His proposal for the research unit is as follows:
        - Create a Division focussing on R&D in the Department
        - Scope: **Management of R&D**, not executing R&D
        - Focus: **Rural Transport**
            - Rural road engineering (including associated structures)
            - Traffic management and safety
            - Transport operations (including passenger transport)
        - Possible structure (streamlined):
            - Deputy Director General
            - Two senior engineering positions:
                - Research and Development Management
                - Knowledge Management
            - Support staff (administrative staff and information specialist)
            - All other positions to be outsourced so as to allow the research unit to expand and contract in line with needs
            - All R&D projects, capacity building activities, skills development initiatives, etc., to be outsourced (or contracted in, including from within DoLIDAR).

- Dr Shrestha recommended that all possible permutations be mapped out on a matrix indicating:
    - Vertically the various options for housing the research unit:
        - DoLIDAR (outsourced)
        - DoLIDAR (in-house research)
        - DoR (both options as above)
        - Institute of Engineering (in-house research)
        - Independent research unit (both options)
        - MoSTE (both options)

- Horizontally, the research focus:
  - Local road network
  - Local and strategic road network
  - + traffic management
  - ++ transport operations

The proposed matrix is shown below, also indicating the preferred options from the perspective of DoLIDAR:

		Local Roads	All Roads	+ Traffic Management	+ Transport Operations
DoLIDAR	**In-house R&D**				
	Outsourced R&D	√		√	√
DoR	**In-house R&D**		?		
	Outsourced R&D				
Inst of Eng	**In-house R&D**		?		
Independent R&D Centre	**In-house R&D**				
	Outsourced R&D				
MoSTE	**In-house R&D**				
	Outsourced R&D				

(MoSTE: Ministry of Science, Technology and the Environment)

6.2.4 Meetings held on 30 May 2017

6.2.4.1 Meeting with Mr. Ram Chandra Shrestha and Mr. Pawan Shrestha (DDGs of DoLIDAR; 11:00-12:00)

The discussions with the Deputy Director Generals of DoLIDAR centred on the institutional location of the research unit. The following were noted:

- Universities are not considered to be a viable option for hosting the research unit:
  - There may be a problem with the ownership and nature of research that will be undertaken, i.e. outputs may not necessarily be aligned with stakeholder objectives;
  - Allocation of funding may be a problem (i.e. budget issues);
  - Universities should operate as potential suppliers of R&D, and should not manage the portfolio of research activities to be undertaken.
- DoLIDAR will have greater ownership of research than DoR:
  - DoR is not really focussed on research;
  - DoR's mandate is to manage the Strategic Road Network (SRN). If they were to host the research unit, the bulk of the research efforts might be directed towards addressing SRN issues, while most of the current challenges are associated with the Local Road Network (LRN).
  - However, DoR should be involved in working groups, technical/steering committees, etc., and research outcomes should be shared with them.
- The establishment of the research unit as an independent entity may not be feasible option with respect to retention of staff (i.e. career ladder progression). Career opportunities in government institutions such as DoLIDAR are significantly better. However, if this is to be considered as a future option, it is recommended that the research unit be established in a state-owned entity first, with the potential to become independent later on.

Mr Pawan Shrestha was of the opinion that the **size** of the research unit should not exceed 10 people and, in terms of scope, that it would be essential to include traffic/transport issues in the research portfolio in order to address pertinent issues and to inform policy from a sound science, engineering and technology base.

DoLIDAR is in the process of drafting a **sub-national infrastructure development policy**, inclusive of proposed organograms. The Consultant pointed out the importance for embedding the research unit in this policy, and also to include the research unit in the organogram. The need for regular communication on what is required from the Consultant and by when was identified as a priority.

6.2.4.2 Meeting with +/- 20 senior staff members of DoLIDAR (14:00-15:50, DoLIDAR)

After a brief introduction by Mr Mohan Chapagain and Mr. Ram Krishna Sapkota (in Nepalese), the Consultant presented progress made to date using Powerpoint slides as a medium (cf. Annex E). The following were tabled/discussed:

- Potential research areas (as identified by the Consultant):
    - Inventory of all roads (including design of the inventory), functional classification, road ownership and managerial responsibility
    - Develop and endorse appropriate norms and standards for LRN bridges
    - Guidelines for climate resilient roads & bridges
    - Incl. Erosion control / slope stability / drainage structures
    - Maintenance: capacity building
    - Quality control/assurance (e.g. laboratory testing proficiency scheme)
    - Manual to assist provincial/municipal engineers to select surface types based on existing road characteristics, available budget, maintenance capacity and availability of materials, equipment and skilled / unskilled labour
    - Guidelines, norms and standards for design, construction and maintenance of gravel roads
    - Develop and implement work norms and technical standards for equipment use on non-engineered unpaved roads
    - Appropriate selection and use of dust suppressants
    - Collect and analyse data from existing trials and experiences, focusing on life cycle costs and suitability. This should be complemented by surfacing trials to be carried out in different ecological zones, looking at promising alternatives.
    - Black spot identification / improvement
    - Vehicle overloading management and enforcement
- The representatives indicated no objection with the above, and also suggested two additional research areas:
    - Asset management and traffic management systems and practices
    - Right of way protection
- Some time was spent discussing the name of the research unit (i.e. proposed changes to the suggested name: “Rural Transport Research Unit”):
    - Within the structure of DoLIDAR, it should not be a “Unit” but rather a “**Division**”;
    - “Rural” (district & village roads) or “Local” (rural and urban roads): “**Local**” was preferred although the term may no longer be accurate (e.g. Provincial roads crossing several districts are no longer considered as “local” roads);
    - Alternative suggested: “sub-national” (i.e. all roads that do not form part of SRN)
    - It was agreed that whatever term is used (“rural” or “local”) it has to be defined properly.

- Discussion took place on how universities should be involved. It was agreed that:
    - They will be a member of the Technical Committee
    - They will be potential suppliers of R&D
    - Use will be made of their R&D infrastructure
    - Their involvement will be defined in the "Strategic relationships & linkages" section of the Business Plan.
- With respect to R&D Management it was noted that research outputs should be such that they also influence policy formulation. The importance of peer reviewing research outputs was also raised.

6.2.4.3 Meeting with Mr. Jeeban Shrestha and Mr. Maheshwor Ghimire (16:20-17:00, MoFALD)

Messrs Shrestha and Ghimiri supported the decision to establish the Local Transport Research Division (LTRD) in DoLIDAR. They expressed reservations similar to those of the DDGs of DoLIDAR about the other alternatives (cf. Section 6.2.4.1).

Initially it was thought to establish the LTRD as a "Resource Centre", namely a laboratory that would be open to universities to support post-graduate research as well as to the private sector for their research, and in doing so create some means for DoLIDAR to generate income.

The name of LTRD (i.e. Local/Rural/sub-national) should be dictated by the possible name change of DoLIDAR.

They noted the need for the Department of Transport Management to be included in both the technical and steering committee.

6.2.5 Meetings held on 31 May 2017

6.2.5.1 Meeting between Mr Sanjaya Kumar Shrestha, DDG Foreign Cooperation Branch of DoR, Mr Mohan Chapagain (DoLIDAR) and the Consultant (10:45-11:45)

The meeting started off with Mr Chapagain presenting a brief introduction on AsCAP and the purpose of the project, followed by the Consultant presenting an overview on progress achieved to date, particularly with respect to institutional location of LTRD and areas of possible synergy/cooperation between DoR and DoLIDAR.

Mr Shrestha then tabled potential focus areas, highlighting the need to concentrate on road safety, which is also an area that DoR is focusing on. Specific areas of road safety that should receive attention include:

- Improved safety features/barriers (i.e. improved standards, development of guidelines, cost-effective retrofitting);
- Condition of vehicles and road user behaviour;
- Relocation of people from hazardous environments (mountainous terrain) to safer environments (hilly/flat terrain) where better services can be provided (i.e. sustainable settlements)

The target is to reduce road fatalities (currently 1,700 to 1,800) by half by 2020[1]. In support of this drive, Mr Shrestha noted that a **Centre of Excellence in Road Safety** is in process of being established at the Institute of Engineering.

[1] Some measures to achieve this goal have already been implemented, such as an age limit (max. 20 years) on vehicles in the Kathmandu Valley and a fine of 200 Rupees or three hours in police custody (with a 30 minute lecture/course or road safety) for jaywalking.

He noted the following:

- The establishment of the Centre is funded by DFID, through DoR, and administered by the World Bank;
- Drafting of a business plan for the Centre is in process;
- The Centre will be headed by the Dean of (Civil) Engineering and will be supported by Professors and other staff members of the Institute;
- The Centre will offer BSc and MSc scholarships, conduct research and provide training courses;
- It could become an autonomous entity in 5 years' time (funded through training programmes, but DoR will continue to contribute where and when required;

Cooperation/synergy between the LTRD and the Centre of Excellence will be essential, also to minimise duplication of efforts.

With respect to other potential research areas, Mr Shrestha stated that the extent of rural road network is "sufficiently adequate" as is, and there should now be a greater focus on improving the conditions of the roads and on road safety. The norm is that an all-weather road should be available within a walking distance of two hours in general, but four hours in mountainous areas. He expressed the view that the construction of non-engineered roads should be prevented, but then also noted that the first focus of the new Municipalities will likely be to construct new roads. Most of the Municipalities are not familiar with upgrading and maintenance – there is a need to raise awareness through seminars and workshops.

In his opinion, the Local Transport Research Division should interact with the following stakeholders:

- Department of Roads (DoR)
- Centre of Excellence in Road Safety
- Nepal Academy of Science and Technology (NAST)
- Department of Transport Management (DoTM)
- Universities (e.g. Institute of Engineering)

Finally, Mr Shrestha noted that **DoR also envisages to establish research capacity** although no timeline has yet been set:

- He confirmed that DoR did have a research & development unit in the past, but is no longer in existence;
- DoR has laboratory infrastructure under the Planning and Design Branch of DoR that can support research;
- The current Road Sector Skills Development Unit, also under the Planning and Design Branch of DoR, will have to be strengthened, also to include R&D;
- R&D will be executed by mainly DoR engineers;
- One of the potential focus areas is the optimisation of the use of marginal materials.

Cooperation/Synergy between the LTRD and the DoR R&D unit will be essential, also to minimise duplication of efforts.

Finally, Mr Shrestha noted that decentralisation (i.e. the implementation of the three tiers of Government) will be challenging for the following reasons:

- At present the skills base in municipalities is non-existent or limited, while a skills base at provincial level will have to be established;
- Road ownership will have to be redefined;
- Asset management systems are (almost) non-existent at provincial and municipal level, which will render decision-making on investments difficult (currently, politically-driven decision processes seem to be the norm).

6.2.5.2 Meeting with Prof Gokarna Bahadur Motra (Campus Chief), Dr Bhaxxt Mandal (Head of Civil Engineering) and Anil Marsani of the Institute of Engineering (13:30-14:30)

The meeting was also attended by Messrs Sapkota and Chapagain of DoLIDAR. At the meeting, it was confirmed that there is already a Memorandum of Understanding in place between DoLIDAR and the Institute of Engineering.

This was followed by sharing of information about the Institute of Engineering:

- 80 per cent of all engineering students of Nepal study at the Institute of Engineering;
- The Institute has three additional campuses outside Kathmandu;
- More information is available on their websites: www.pcampusioe.edu.np and www.ioe.edu.np.

Potential areas of cooperation between the LTRD and the Institute were discussed. These could include:

- With respect to Knowledge Management:
    - Senior staff members of the Institute would serve as members of the R&D Output Peer Review Panel that the LTRD will have to establish;
    - The outputs generated by the Institute (e.g. Master and PhD dissertations) could be integrated in the electronic library of the LTRD (a list of past, present and planned research outputs of the Institute is provided in Annex F).
- With respect to knowledge creation (i.e. research and development activities):
    - The Institute could act as an R&D supplier:
        - They already conduct applied research (cf. Annex F);
        - They can appoint Bachelor and post-graduate student to work on projects, led by senior staff member(s) of the Institute;
        - The Institute will guarantee the quality of R&D activities and outputs.
    - The Institute can provide the necessary research infrastructure (e.g. laboratories[2]) to support the R&D activities led by either the Institute or other R&D suppliers.

Mr Sapkota indicated that DoLIDAR would be prepared to support the Institute's research activities in line with the mandate and needs of DoLIDAR.

6.2.5.3 Feedback meeting attended by DoLIDAR officials and Dr Chandra Shrestha (over dinner)

The purpose of the meeting was to review the previous days' activities and to agree on a way forward. The following were discussed/agreed:

- As yet, there is no clear line Ministry for DoLIDAR identified ('potential risk'), and DoLIDAR is in the process of motivating its future role in central government ('challenge'). The Local Transport Research Division is one of the means by which to demonstrate DoLIDAR's relevance. Hence the importance of the business plan.
    - The cross-sectorial involvement in the Steering Committee to set policy directives for the LTRD needs to be highlighted in the business plan;
    - The business plan also has to take cognisance of, and be aligned with the character of DoLIDAR, which is different to that of DoR: DoLIDAR works with people to effect

[2] The Institute of Engineering has a *Student Laboratory* that provides basic binder, asphalt, soil and concrete testing, as well as a *Consultant Laboratory* with calibrated equipment. The latter will be used for R&D work to be provided to the LTRD.

change at local level (one of few Departments doing so), while DoR implements projects for national good;

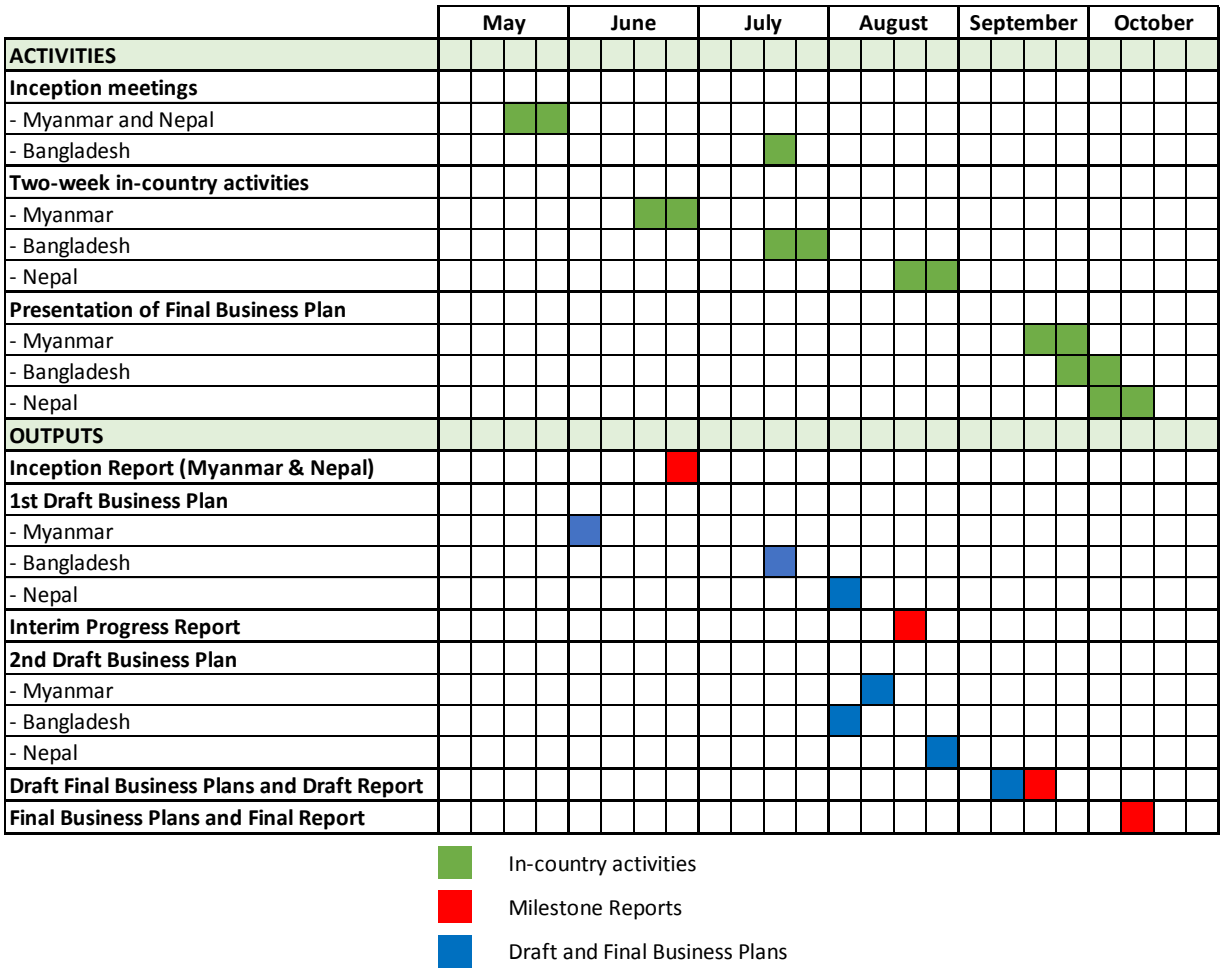
- The LTRD would also need to manage key technical skills for capacity building at provincial/municipal level.

- Dr Shrestha suggested that there are potentially three legs to the LTRD:
  - R&D Management
  - Knowledge Management
  - Pool of accredited specialists that can be contracted in as and when required.
- The institutional location of the LTRD within the structure of DoLIDAR will require some further deliberation. Should it be a Division, or a fairly autonomous entity reporting to the Director General?
- It was agreed that the Consultant would prepare a preliminary rough draft of the business plan prior to his next visit to Nepal in August 2017.

7. Revised Activity Schedule

The revised Activity Schedule (Gantt chart) is shown below. It should be noted that the schedule might have to be adjusted to accommodate circumstances beyond the control of the Consultant (i.e. Stakeholder requests to accelerate the process or to postpone visits).

The plan is to complete the project by the contractual due date of 16 October 2017.



Annex A: Planned activities to be undertaken

TASK 1: INCEPTION (6 weeks) **AND MANAGEMENT** (over 24 weeks)

1.1	Nomination and confirmation by the government departments of Counterpart Staff to work in association with the Service Provider. The Counterpart Staff will be responsible for facilitating interactions between the Service Provider and relevant stakeholders (including the setting up of meetings), coordination of all in-country activities and providing all relevant background documentation and information.	Week 1
1.2	Initiate communication between the Service Provider and the Counterpart Staff, also to plan and coordinate the in-country Inception Meetings/Workshops to be held between Week 3 and 5, and to request them to send all available information pertaining to the subject of this study to the Service Provider.	Week 1
1.3	Study all relevant reports obtained from Counterpart Staff, ReCAP and the internet, including country research plans; draft research strategies (if available); other appropriate country/sector reports, and assess lessons learnt from similar initiatives conducted elsewhere.	Week 1/2
1.4	Development of a preliminary implementation plan in association with Counterpart Staff, and initiate preparations for the in-country Inception Meetings/Workshops.	Week 2
1.5	Inception meetings in the three countries with senior government staff, followed up by meetings with key stakeholders (other government institutions, universities, policy/research bodies, etc.) to discuss and reach agreement on: • Objective, scope, activities, timeline and outputs of the project; • Identified R&D needs and processes that could be deployed for the identification of new R&D needs (e.g. through a survey); • Proposed structures that could be established to provide technical guidance and direction (e.g. Road Research Technical Committees) and to provide strategic oversight (e.g. National Steering Committees), and potential external stakeholders that could be involved in both these committees (e.g. technical experts from the public and private sector for the Technical Committee, and senior officials from government for the Steering Committee); • Internal capacity to undertake research in-house (potential research staff as well as potential research infrastructure, such as laboratories and the information centre) versus outsourcing of R&D, and proposed format of the R&D entity within the institutional structures of the government department; • Potential funding mechanisms to support R&D activities; • Processes, methods and systems for the uptake and embedment of research outcomes; • Strategic relationships and linkages;	Week 3 to 5

- The proposed structure and layout of the main project deliverables.

1.6	Finalisation of implementation plan and drafting of Inception Report. The Inception Report will contain initial findings, confirm the methodology, and include the proposed implementation plan, a detailed work programme, staffing, identified constraints and proposed solutions.	Week 6
1.7	Second series of country visits (10 working days per country) to hold detailed discussions on all aspects of the business plan, as outlined in Tasks 2 and 3 below**,** and initiate drafting of the individual Business Plans.	Weeks 7 to 16
1.8	Prepare a Progress Report summarising work performed, milestones achieved since Inception, and schedule of activities for the remaining duration of the project, including the reporting of any deviations and action plans to minimise their impact on future activities. The preliminary draft Business Plans for the three countries will be included as annexures to the Progress Report.	Week 16
1.9	Complete the Draft Business Plans (draft national establishment plans and indicative budgets) for all three countries in a format ready for presentation to the National Steering Committees.	Week 20
1.10	Presentation of the Draft Business Plans to the National Steering Committees in the three countries for discussion and endorsement. This will be followed up with discussions on the finalisation of the business plans with respective government departments.	Weeks 21 to 24
1.11	Submit Final Business Plans for the three countries, inclusive of recommendations on any further ReCAP/AsCAP support and/or possible joint support from other stakeholders (including other donor support) required in the short to medium term.	Week 24

TASK 2: INSTITUTIONAL ASPECTS

2.1 Governance

2.1.1	Develop a preliminary framework, Terms of Reference, composition and structure for Road Research Technical Committees (Week 2), and discuss with and seek endorsement from the respective government departments and other stakeholders nominated by the respective government departments.	Week 3 to 5
2.1.2	In association with the respective government departments and Counterpart Staff during Inception: • Identify provisional institutional structures for the Road Research Units/Centres; • Identify legislative processes needed to establish the Road Research Units/Centres; and • Draft a preliminary outline for the Business Plans for the Road Research Units/Centres with a 3 year horizon, outlining the vision, mission and goals of the Road Research Units/Centres, and the organisation and business of the Road Research Units/Centres (inclusive of budgets) - to be further updated in Weeks 16 to 20 and finalised by Week 20 - for discussion and	Week 3 to 5

	endorsement at the National Steering Committees (to be held in weeks 21 to 24)	
2.1.3	Through the respective government departments and guidance provided to the respective government departments by other stakeholders, nominate and constitute the Road Research Technical Committees)	Week 5 to 6
2.1.4	Hold the first meeting of the Road Research Technical Committee (RRTC): (a) to confirm the terms of reference for the RRTC; (b) to map current research being undertaken; and (c) to map, discuss and agree on main short and longer-term research needs and their prioritisation, and broad processes for the management of research.	Week 7 to 16
2.1.5	Based on the feedback received from the Road Research Technical Committees: • Modify the implementation plan (if required) and consolidate research priorities in a draft strategic research plan; • Incorporate draft strategic research plan in the draft Business Plans for the Road Research Units/Centres and refine the Business Plans, and • Draft action agenda for addressing all outstanding critical and non-critical legislative, institutional and other barriers impacting on implementation of the Road Research Units/Centres.	Week 7 to 16
2.1.6	Finalise draft Business Plans in association with the respective government departments	Week 16 to 20
2.2	**Sources of Funding**	
2.2.1	In consultation with the respective government departments, identify and confirm potential sources of funding for the Road Research Units/Centres.	Week 7 to 16
2.2.2	Develop a preliminary funding model for the Road Research Units/Centres to support the estimated cost structure of the Road Research Units/Centres, including its staff, facilities and operations, and incorporate in the revised draft Business Plans	Week 16 to 20
2.2.3	Provide assistance to the respective government departments to secure commitment from the respective government departments and external funding agents to financially support the Road Research Units/Centres in both the short and long term.	Weeks 16 to 24
2.3	**Road Research Units/Centres Localisation**	
2.3.1	In association with the respective government departments, identify suitable physical locations for the Road Research Units/Centres to address both the short and long term needs, and develop preliminary recommendations based on, inter alia, geographic location, office space, status of research infrastructure at these locations, and the ability of the location to support future growth.	Week 7 to 16
2.3.2	In association with the respective government departments and the National Steering Committees, facilitate approval for the proposed location of the Road Research Units/Centres	Week 21 to 24

2.4 Partnerships and Networking

2.4.1	Identify appropriate national, regional and international bodies that the Road Research Units/Centres could become a member of, and assist the respective government departments in identifying arrangements for the Road Research Units/Centres to attain membership of the most relevant bodies.	Week 7 to 20
2.4.2	Identify national, regional and international (research) organisations with whom the Road Research Units/Centres could interact with in order to accrue benefits such as involvement in collaborative research, information exchanges and possible staff exchanges.	Week 7 to 20

TASK 3: CAPACITY ASPECTS

3.1 Human Resources

3.1.1	In association with the respective government departments, align research strategies and priorities with short and long-term research capacity and researcher profiles required to match the needs, develop an organogram for the Road Research Units/Centres, and propose both short and long-term staffing plans (i.e. competency mapping)	Week 7 to 16
3.1.2	In association with the respective government departments, develop a generic capacity building and skills development plan, and incorporate into Business Plans.	Week 16 to 20

3.2 Research infrastructure (hard and soft)

3.2.1	Based on a preliminary assessment of available laboratory equipment/ facilities (week 3 to 5), and the potential facilities to host the Road Research Units/Centres and the plan of action for aligning research facilities and research infrastructure at the preferred location with the short and long-term research needs identified (Week 7 to 16), recommendations and a preliminary resource plans will be developed for addressing: • The optimal usage of existing laboratory equipment and facilities, either located at the Road Research Units/Centres or elsewhere; • New laboratory equipment/plant required to address immediate and future research needs; • Office accommodation; • The optimisation/implementation of ICT support infrastructure (e.g. IT networks, databases, etc.); • Systems and facilities for capturing and storing field and laboratory data and information in hard and/or soft format; • The provision of a knowledge centre (library, document archiving facility, etc.); • Other facilities and equipment identified in the action plan (e.g. vehicles, workshops, storage areas, etc.).	Week 7 to 16
3.2.2	Incorporation of the preliminary resource plans in the draft Business Plans	Week 16 to 20

Annex B: Presentation made to DRD (Myanmar) on 26 May 2017

AsCAP Asia Community Access Partnership

UKaid from the British people

Establishment of Rural Road Research Unit in Myanmar

Inception Meeting

Cardno

AsCAP Asia Community Access Partnership

Project Overview:

- **Background:**
  - Establishment of Rural Road Research Unit identified as a high priority
    - AsCAP Report (August 2016)
    - National Strategy for Rural Roads and Access (March 2017)
  - AsCAP to provide support for:
    - Phase 1: Development of Business Plan
    - Phase 2: Physical establishment of Rural Road Research Unit, inclusive of capacity building of staff

AsCAP Asia Community Access Partnership

Project Overview:

- **Objectives of Unit:**
  - Development, application and dissemination of cost-effective technologies and resilient solutions for rural roads based on the use of local resources and materials
  - Management/execution of research activities
    - Monitoring of performance of surfacing trials, road protection measures, complementary access infrastructure
    - Development and trialling of new standards and policies
  - Material testing and supporting quality control

AsCAP Asia Community Access Partnership

Project Overview:

- **Timeline** (Phase 1: 24 weeks)
  - Start date: 1 May 2017
  - Inception meeting: Week 4
  - First (rough) draft of Business Plan: Weeks 5 to 7
  - Second 10-day visit: proposed 19-30 June 2017
    - In-country meetings with stakeholders
    - Production of second draft of Business Plan
  - Final Draft of Business Plan: Week 20
  - Presentation of Final Draft to Steering Committee towards end September / early October (could be fast-tracked)

AsCAP Asia Community Access Partnership

Project Overview:

- **Intended output:**
  - Business Plan covering:
    - Vision, mission and strategic objectives
    - Governance (Strategic oversight; Institutional structure and physical location; sources of funding; KPIs and targets; strategic relationships and linkages)
    - Research Plan (technical committee; rural road research strategic plan)
    - Operations (human resources and capacity building; research infrastructure)
    - Technology transfer (knowledge management and transfer)
    - Operational budget

AsCAP Asia Community Access Partnership

Discussion :

- **Counterpart staff:**
  - DRD: Soe Soe Oo
  - Cardno: Nandar Kyaw

AsCAP Asia Community Access Partnership

Discussion :

- **Rural Road Research Technical Committee:**
  - Provision of advice on:
    - Research, development and implementation needs and priorities
    - Strategic research plans and research portfolio plans
    - Review of research proposals in line with strategy
    - Review of outputs and outcomes of R&D programme
  - Proposed membership (technical experts):
    - DRD, MOBA, DOH/DOB of MOC, MOTC, universities, Myanmar Engineering Society (MES), ~~Contractors,~~ Development Partners (as observes)

AsCAP Asia Community Access Partnership

Discussion :

- **Governance:**
  - Purpose:
    - Provide oversight on establishment of Road Research Unit
    - Review and endorsement of recommendations of Rural Road Research Technical Committee
    - Identification of funding sources/mechanisms
    - Broad assessment of outputs and outcomes of Road Research Centre
  - Three Committees (National Strategy for Rural Roads and Access):
    - Regional R&B Steering Committee
    - **Regional R&B Implementation Committee**
    - Regional R&B Supervision Committee
    - (and *Regional R&B Development Committee*)

97. **Regional Road & Bridge Steering Committee**. The *Regional Road & Bridge Steering Committee* is chaired by the ministers from the different transport ministries, and includes all the state/regional ministers of transport, the director generals for DRD and MOBA, and the permanent secretaries for MOC and MoTC. It is responsible for approving and issuing this *National Strategy for Rural Roads and Access* and for ensuring that its objectives are achieved. The Steering Committee will also be responsible for approving the multiannual investment plans, negotiating (multi)annual rural road financing levels, introducing the Road Fund, creating a National Rural Road Agency, and issuing the Rural Road Standards and Specifications.
98. **Regional Road & Bridge Implementation Committee**. The *Regional Road & Bridge Implementation Committee* is chaired by the Permanent Secretaries for MOC and MoTC and includes the Director Generals for DRD, RTAD, DOH, DOB and MOBA. It is responsible for preparing rural road standards, for quality control of rural road works, for coordinating and facilitating land acquisition, and for preparing progress reports regarding the rural road sector indicators. It will also be responsible for reviewing (multi)annual plans.
99. **Regional Road & Bridge Supervision Committee**. The *Regional Road & Bridge Supervision Committees* exist in each state/region and are chaired by the State/Regional Minister for Transport. Other members include the state/regional director generals for DRD, DOH, MOBA and RTAD. This committee will be responsible for preparing the state/regional investment plans for rural roads in the different townships within each state/region, and for coordinating between the different road related ministries.

Annex C: Invitation letter for RRRTC meeting

Dear Sir/Madam,

Invitation to the Inaugural Meeting of the Rural Road Research Technical Committee

The purpose of this letter is to invite you to become a member of the Rural Road Research Technical Committee that will guide the development of a national rural road research plan, and to attend the inaugural meeting of this Committee which will be held on <date> at <Place>.

The Department of Rural Development (DRD) of the Ministry of Agriculture, Livestock and Irrigation (MOALI) identified the need for establishing rural road research capacity in Myanmar as a high priority in order to support and sustain research and knowledge management related to rural access. The need to establish this capacity was also identified in the *National Strategy for Rural Roads and Access* (March 2017) it which it is stated that:

DRD in collaboration with MOBA will set up a research and development unit that will be responsible for material testing, supporting quality control, and developing and trialing new standards. Laboratories will be set up and proper procedures will be developed for material testing, quality control and trialing of new standards. Development partners will be requested to support the setting up of the laboratories and the development of procedures, to assist in the trialing and development of new standards, and to build the capacity of DRD and MOBA staff.

The Asia Community Access Partnership (AsCAP), a programme funded by a grant from the UK Government through the Department for International Development (DFID) has initiated a project to assist Myanmar with the establishment of a Research and Development Unit (RDU) in line with the above. The first phase of the support provided by AsCAP is to develop a business plan to support the formation of the RDU.

A strategic research plan, which will define the scope of the activities to be undertaken by the RDU, will form an integral part of the Business Plan. To provide technical guidance and direction to the RDU and to advise the RDU on the nature and scope of research and development activities to be undertaken on rural roads, a Rural Road Research Technical Committee is being established.

The role and responsibilities of the Rural Road Research Technical Committee could include:

- To advise on research and development needs and priorities;
- To assist with technology foresight studies;
- To advise on strategic plans and research portfolio plans for the research and development programme;
- To assist in the review of research proposals in line with the strategy;
- To assist in the review of outputs and outcomes of research and development projects;
- To assist in assessing the impact of research and development activities.

It will be appreciated if you could confirm your willingness to serve as a member of the Rural Road Research Technical Committee, and your availability to attend the inaugural meeting of this Committee.

A draft agenda for the inaugural meeting is attached to this letter.

Yours sincerely,

DRAFT AGENDA FOR THE INAUGURAL MEETING OF THE RURAL ROAD RESEARCH TECHNICAL COMMITTEE

Date: xx June 2017
Time: (to be confirmed)
Venue: (to be confirmed)

1. Welcome note

2. Implementation Plan for the Establishment of the Research Development Unit

3. Role and Responsibilities of the Rural Road Research Technical Committee (RRRTC)
   - 3.1 Agreement on the Terms of Reference for the RRRTC
   - 3.2 Membership of the RRRTC
   - 3.3 Appointment of Chairperson for the RRRTC
   - 3.4 Frequency of RRRTC meetings
   - 3.5 Relationship between the RRRTC and the Steering Committee

4. Identification and prioritisation of Research Needs
   - 4.1 Overview of past and present road research undertaken in Myanmar
   - 4.2 Identification of research needs
   - 4.3 Prioritisation of research needs

5. Way Forward

6. Any Other Business

7. Date of Next Meeting

8. Closure

Annex D: Consultant's notes on the Nepal Road Sector Assessment Study

Both the Main Report and Annexes of the *Nepal Road Sector Assessment Study* (December 2012) were studied by the Consultant. This *Road Sector Assessment Study* was prepared by the World Bank with the active involvement of the Government of Nepal, the Department for International Development (DFID), the Asian Development Bank (ADB) and the Swiss Agency for Development and Cooperation (SDC). The purpose of this study was to determine the current status of the road sector in Nepal, identify the main issues and problems it is facing, and provide practical means to address them.

The following provides a summary of the document, from the perspective of the Consultant:

- **GENERAL**
  - Overall, the perception was created that there is a lack of efficiency and effectiveness. There appear to be too many organizational structures with no clear directives; no clear ownership and managerial responsibility for roads; hamstrung capacity in districts; and a significant amount of the administrative burden that limits effectiveness.
  - While increased investment in rural roads resulted in an explosive expansion of the rural road network, it may not necessarily be durable/sustainable due to a lack of proper quality assurance in construction and the absence of adequate maintenance. Implementation capacity is a limiting factor in the efficient use of available funding.

- **POTENTIALLY ADDITIONAL RESEARCH TOPICS IDENTIFIED:**
  - Inventory of all roads (including design of inventory), functional classification, road ownership & managerial responsibility. Some problems identified:
    - Large number of non-engineered roads constructed in the last 5-10 years, generally by Village Development Committees (VDCs), have not been entered into inventories.
    - Inventories and condition surveys are not being used or updated by District Development Committees (DDC) and District Technical Office (DTO) engineers.
    - Data collected by DDCs and sent to central level, is not being compiled into an integrated product. For instance, the Roads Board Nepal (RBN) receives road inventories every year from most of the districts, based on which they allocate their funding. However, these inventories are not made available to DoLIDAR on a standard basis, nor is the information compiled into a national road inventory.
  - Design, construction and maintenance of gravel roads (~40-50% of Local Road Network (LRN))
    - Significant gravel loss with periodic regravelling not done, resulting in total loss of gravel.
    - Problems: riverbed gravels; grading and PI (gravel loss and dust formation); often no compaction (placed by hand).
  - Non-engineered roads:
    - Develop and implement work norms and technical standards for equipment use.

        - Develop directives regarding minimum levels of engineering required for road development projects (these should include appropriate procedures to minimize environmental impact).
        - Update the Labour-based, Environmentally-friendly, Participatory approach (LEP) approach to incorporate the use of equipment, creating a Labour-Based, Equipment Supported (LBES) approach. This approach should include appropriate work norms and technical standards for labour and equipment, but should also include suitable implementation modalities forming a proper balance between public fund transfers to user committees and public procurement of contractors.
    - Equipment norms:
        - Equipment norms do not exist, despite the widespread use of equipment at district level. Agreements with Local Road User Committees (LRUCs) are based on labour-based approaches, leading to related norms being misused to generate significant profits. Different norms are used by DoR and DoLIDAR.
        - Introduce LBES concept as a replacement of the LEP approach, applying a more appropriate mix of labour and equipment. Develop equipment norms in line with existing DoR norms to be applied in this concept. Ensure existing labour-based norms are appropriate and harmonized. Review existing rural road standards.
    - Prepare a manual to assist district engineers to select surface types based on existing road characteristics, available budget, maintenance capacity and availability of materials, equipment and skilled / unskilled labour.
    - Revise the road surface classification standards and technical specifications to include concrete and stone/block paving. This is best done through an amendment of the Nepal Rural Road Standards (2010). This updated classification should also be reflected in the road inventory and condition survey forms, as well as other documents, to avoid ambiguity.
    - Collect and analyse data from existing trials and experiences, focusing on life cycle costs and suitability. This should be complemented by surfacing trials to be carried out in different ecological zones, looking at promising alternatives.
    - Overall, for Road Surfacings (main report)**:**
        - Ensure SRN and LRN road inventories include recent surface data, distinguish different bituminous surface types and include alternatives such as cement concrete and stone paving.
        - Review and harmonize surfacing standards for both SRN and LRN, and monitor compliance. Make surfacing standards dependent on traffic levels based on an analysis of economic costs. Focus more on asphalt concrete for high volume SRN roads and review alternative surface types for low volume SRN and LRN roads.
        - Carry out surface trials and collect data on the performance of surface types present in Nepal.
    - Road safety:
        - Require all new generation LRN projects (new construction, rehabilitation, upgrading) to include specific provisions for road safety in their planning and design parameters, based on standards and norms to be developed by DoLIDAR.

- **OVERVIEW OF DOLIDAR**:
  - ***Objectives:***
    - The objective of DoLIDAR is to undertake infrastructure development programmes in accordance with decentralization policies for attaining the goals set forth by the Government of Nepal's National Strategy for Rural Infrastructure Development by making the local authorities technically capable and competent and ensuring their accountable participation. For this various infrastructure development activities funded through government and donor agencies are to be undertaken, in co-ordination with other concerned agencies, in professional and sustainable manner so as to ensure desired quality
  - ***Function:***
    - In direct co-ordination with other line departments (such as Department of Roads, Department of Irrigation, Department of Water Supply and Sewerage, Department of Housing and Urban Development, Department of Electricity Development etc.) and in accordance with national policies and guidelines this department will undertake the following:
      - Implement or arrange to implement the Agriculture and Rural Roads programmes under Agricultural Perspective Plan
      - Undertake or arrange to undertake planning of local-level rural roads, irrigation and river control, water supply and sanitation, suspension bridge, housing and building, rural energy and others under the ministry in co-ordination with local authorities.
      - Undertake or arrange to undertake the monitoring and evaluation of local-level rural roads, irrigation and river control, water supply and sanitation, suspension bridge, housing and building, rural energy and other programmes;
      - Assist local authorities in preparing resources maps, periodic plans and undertaking technical studies.
      - **Undertake activities for enhancing technical capability of the local authorities to implement local infrastructure development programmes.**
      - Co-ordination of the donor funded projects for providing technical and administrative support on behalf of the government.
      - **Assist the ministry by preparing technical proposal and suggestions for developing national and regional policies relating to construction and development;**
      - Preparing and implementing necessary technical human resources development plan for the department as well as local authorities;
      - **Establishing and operating centres for quality control and maintenance of construction and survey equipment**
      - **Preparing various Norms, Standards and Manuals and providing training and orientation within the agency for uniformity and simplicity in infrastructure development programmes**

- **Organizing workshops and seminars** for monitoring, progress review and impact evaluation of the ongoing infrastructure development projects
- Monitoring and evaluation of the civil construction and development activities implemented by different autonomous authorities within the Ministry of Local Development
- **Development and promotion of suitable technology for local infrastructure development**
- Coordinate with the different ministries to implement their local level construction and development activities through local authorities
- Providing technical support for the donor funded projects as stipulated in the agreement and integrate their scattered resources to enhance the local level technical capability
- Assess and evaluate the environmental aspects of the infrastructure projects and promote these skills and techniques to the local institutions
- Introduce disaster mitigation measures in the infrastructure development activities
- **Establish and manage the information, documentation centre and library**
- Provide necessary assistance to the concerned agencies for solid waste management
- Manage to Implement the infrastructure development programs of other departments if requested with authorities

- ***Responsibilities:***
  - Assists Ministry of Local Development (MoLD) to coordinate and support local bodies regarding local infrastructure
  - Policy formulation and norm setting regarding local infrastructure
  - Monitoring & evaluation, as well as information management and dissemination
  - Provides technical support to DDCs through District Technical Offices (DTO)

  Information management and dissemination often hamstrung by:
  - Local Development Officers and DDCs reporting directly to MoLD, bypassing DoLIDAR;
  - Roads Board Nepal (RBN) accepting data and providing data to DDCs without informing DoLIDAR

  Because of the above, DoLIDAR does not have the ability to properly analyse the information. As a result, DoLIDAR has no clear overview regarding the existing situation and trends in the rural road sector, which it requires to perform its other duties.
- Efforts were underway to internalize some line agencies into the DDC. One of these was the **District Technical Office (DTO)** under DoLIDAR, which was placed within the DDC as a temporary measure to ensure sufficient technical capacity in the district until the DDC could create its own technical section. As such, the **DTO was responsible for providing technical inputs regarding all rural infrastructure including the LRN**. The devolution agenda has since then stalled, however, rendering

the positioning of the DTO rather unclear, while the district technical capacity remains insufficient.

- DTO provides technical support, undertakes or oversees preliminary and detailed design of road interventions
- DTOs are responsible for design and cost estimates for too many local infrastructure projects with too little staff, which inevitably compromises quality, transparency and accountability.
- *Proposed action [Report]:* Undertake an institutional assessment of MoLD, DoLIDAR, DTO and DDC to ascertain proper positioning of the DTO. The assessment should also look at the level and appropriateness of technical services currently provided by DDC/DTO for the LRN. Balance the technical capacity of the DDC/DTO with the workload by focusing on fewer priority projects and/or increasing human resources (including outsourcing)

- **OVERVIEW OF DDCs**
  - Lack of resources in districts (DTO and DDC) – on average on engineer and a couple of sub-engineers.
  - In practice the district council does not exist and is replaced by a joint committee of representatives from local political parties, chaired by a Local Development Officer (LDO) appointed by MoLD as the DDC Secretary.
  - DDC has no accountability, and many norms and administrative procedures are flaunted (e.g. panning/reporting of activities; allocation of funding).
  - Friction (funding; political) between DTO and DDC – LDO reports to DoLIDAR and DDC/LDO to MoLD – complicating coordination and sharing of information.
  - DTO should be assigned greater responsibility

- **OVERVIEW OF ROADS BOARD NEPAL (RBN)**
  - Funding is obtained from the fuel levy, vehicle registration fee, road tolls, and Government of Nepal or donor funds.
  - Makes funding available to road agencies for repairing and maintaining roads.
  - Of the total RBN funding for road maintenance, an average of 70% goes to the SRN for funding of emergency, routine, recurrent, specific and periodic maintenance (in order of priority).
  - Although envisaged as a single window for maintenance funding, RBN has not lived up to this expectation and for many years additional SRN maintenance funding was also provided by DoR from its development fund allocated by the Ministry of Finance (more recently this funding was channelled through RBN).
  - RBN provides some of the funding (10% of rural road maintenance funding) directly to DDCs (bypassing DoLIDAR)
  - Receives important road data from the districts, and probably has more complete data than DoLIDAR, although it is not clear how this data is used except for determining the funding levels.
  - RBN also has the authority to set standards regarding road maintenance, duplicating the role of DoLIDAR

- **NOTES ON THE DEPARTMENT OF ROADS (DOR)**
  - Falls under a different ministry, the Ministry of Physical Planning and Works (MoPPW)
  - Although responsible for the SRN, it is active on a number of rural roads.
  - Vice versa, DDCs funding is sometimes deployed on some SRN roads where DDCs feel DoR is not doing enough.
  - Other transport related issues such as safety and transport management are currently the responsibility of the Ministry of Labour and Transport Management.

- **ACTION ITEMS NOTED: DOLIDAR AND DOR [extracts from Study Report]:**
  - The organizational structures of DoLIDAR and DoR have not changed for the past 10-15 years, and is inadequate in light of the increasing work volume and budgets, resulting in poor expenditure efficiency and a lack of proper supervision. Managerial and technical capacities of staff are inadequate;
  - Carry out a study regarding the restructuring of DoLIDAR and DoR and promote outsourcing to increase efficiency and capacity. Increase managerial and technical capacities of staff through capacity building programs.

Figure D.1 presents the organisational chart for the road sector in Nepal (2012).

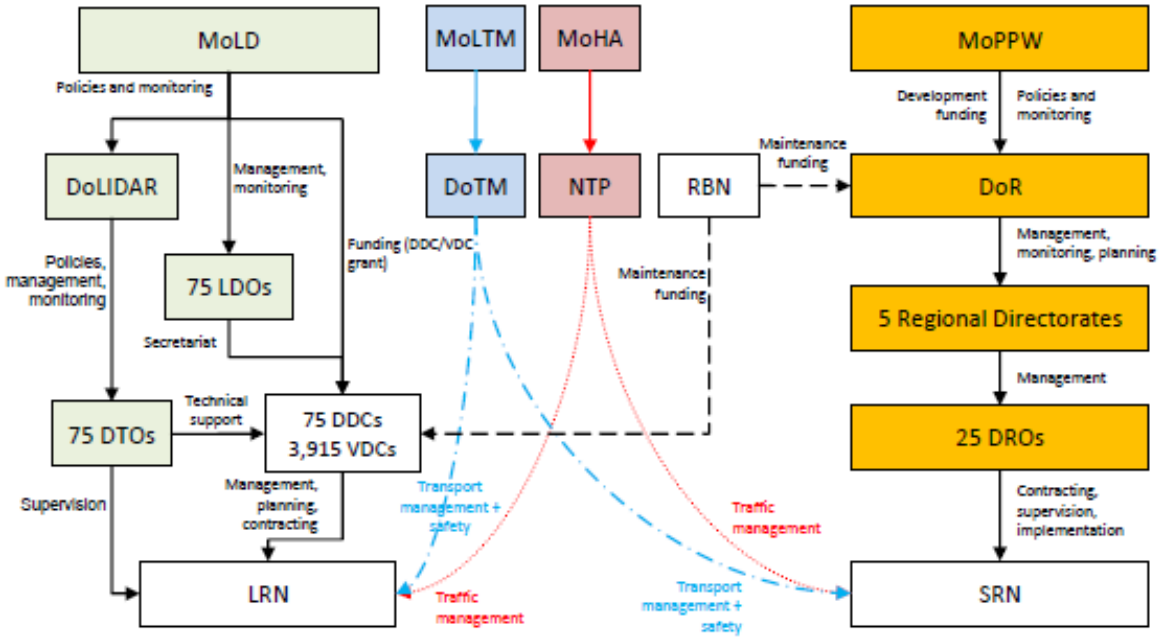


FIGURE D.1: Organisational chart for the road sector in Nepal (*Nepal Road Sector Assessment Study*, December 2012)

Annex E: Presentation made to DoLIDAR (Nepal) on 30 May 2017

AsCAP Asia Community Access Partnership

UKaid from the British people

Establishment of Rural Road Research Unit in Nepal

Inception Meeting

Cardno

AsCAP Asia Community Access Partnership

Presentation layout:

- Project overview
- Vision & Mission
- Institutional location
- Value proposition
- Goal & Strategic objectives
- Potential Research focus areas

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Project Overview:

- **Background**
  - The need for some form of road research capacity within the partner government departments of Nepal, Bangladesh and Myanmar was identified as a high priority and a major constraint to the sustainable management of research and knowledge management related to rural access.
  - This initiative should be seen as an establishment phase to develop detailed actions and establishments plans based on the needs of the individual countries.

AsCAP Asia Community Access Partnership

Project Overview:

- **Overall aim (Phase 1):**
  - To develop establishment plans, modes of operation and indicative budgets for individual AsCAP countries in line with their needs for the sustainable management of research related to rural access.
  - The key impacted groups will be the national government departments responsible for the provision and management of rural infrastructure in the respective AsCAP member countries.

AsCAP Asia Community Access Partnership

Project Overview:

- **Timeline** (***Phase 1***: 24 weeks)
  - Start date: 1 May 2017
  - Inception meeting: Week 5
  - First (rough) draft of Business Plan: end-June
  - Second 10-day visit: proposed 21 Aug – 1 Sept
    - In-country meetings with stakeholders
    - Production of second draft of Business Plan
  - Final Draft of Business Plan: end September
  - Presentation of Final Draft to Steering Committee towards end September / early October

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Agreed :

- **Counterpart official:**
  - Mr. Mohan Chapagain

Project Overview:

- **Intended output:**
  - Business Plan covering:
    - Vision, mission and strategic objectives
    - Governance (Strategic oversight; Institutional structure and physical location; sources of funding; KPIs and targets; strategic relationships and linkages)
    - Research Plan (technical committee; rural road research strategic plan)
    - Operations (incl. human resources and capacity building)
    - Technology transfer (knowledge management and transfer)
    - Operational budget

Vision (example):

- To be the national Rural Transport Research Unit providing scientific, engineering and technological leadership to the Nepalese government and the private sector for attaining a network of good quality and safe rural roads, offering a high level of satisfaction to its users

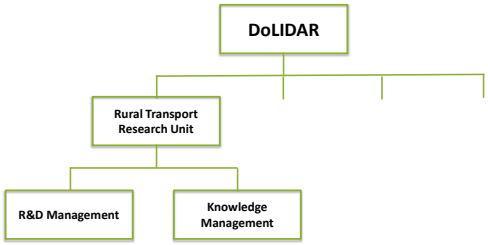
Mission (example):

- Through research, development, implementation and dissemination of research outcomes, to enhance rural connectivity and connectivity to the strategic road network, and to ensure the transportation of people, goods and services in a safe, economic and sustainable manner, contributing to economic, social and cultural development.

Scope and Institutional Location:

		Local Roads	All Roads	+ Traffic Management	+ Transport Operations
DoLIDAR	In-house R&D				
	Outsourced R&D	√		√	√
DoR	In-house R&D		?		
	Outsourced R&D				
Inst of Eng	In-house R&D		?		
Independent R&D Centre	In-house R&D				
	Outsourced R&D				
MoSTE	In-house R&D				
	Outsourced R&D				

Institutional Structure (DoLIDAR/Outsourcing):



Value proposition (example):

- The establishment of the Rural Transport Research Unit is a high priority for government, the private sector and the development of Nepal. Once established and fully operational, the Unit will add value to Nepal through the provision of:
  - access to a multidisciplinary skills and expertise base in road engineering;
  - core competences for developing and/or updating guidelines, norms and standards for the road/transport sector, key solutions and products;
  - access to Research Infrastructure, including appropriate materials testing laboratories;

Value proposition (continued):

- … through the provision of:
  - an information resource centre that will be a repository for, inter alia, text books, local and international conference proceedings and journals, research reports, technical guidelines, norms and standards accessible to all stakeholders; and
  - capabilities for developing solutions and products aimed at solving road and transport-related problems that impact significantly on the national priorities of Nepal, including socio-economic growth and development and public service delivery, thus leading to socio-economic impact and public good.

Goal:

- The goal of the Rural Transport Research Unit is to serve the road engineering and transport needs of the public and private sector of Nepal through the development, application and dissemination of best practices and new knowledge, and the development of human capital.
- It will strive to provide practical, innovative, cost-effective R&D based solutions that:
  - address the current and future rural road infrastructure and transport needs of the country;
  - support sustainable development and asset preservation; and
  - enhance socio-economic impact.

Goal (continued):

- It will provide innovative engineering solutions for the design, construction, maintenance and management of road infrastructure and for efficient and safe transport operations, based on basic and applied research supporting the provision of a sustainable and cost-effective (rural) road network.

Potential Research needs:

- Inventory of all roads (including design of the inventory), functional classification, road ownership & managerial responsibility
- Develop and endorse appropriate norms and standards for LRN bridges
- Guidelines for climate resilient roads & bridges
  - Incl. Erosion control / slope stability / drainage structures
- Maintenance: capacity building
- Quality control/assurance (e.g. laboratory testing proficiency scheme)

Potential Research needs (continued):

- Manual to assist provincial/municipal engineers to select surface types based on existing road characteristics, available budget, maintenance capacity and availability of materials, equipment and skilled / unskilled labour
- Guidelines, norms and standards for design, construction and maintenance of gravel roads
- Develop and implement work norms and technical standards for equipment use on non-engineered unpaved roads
- Appropriate selection and use of dust suppressants

Potential Research needs (continued):

- Collect and analyse data from existing trials and experiences, focusing on life cycle costs and suitability. This should be complemented by surfacing trials to be carried out in different ecological zones, looking at promising alternatives.
- Black spot identification / improvement
- Vehicle overloading management and enforcement

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Discussion :

- **Road Research Technical Committee:**
  - Provision of advice on:
    - Research, development and implementation needs and priorities
    - Strategic research plans and research portfolio plans
    - Review of research proposals in line with strategy
    - Review of outputs and outcomes of R&D programme
  - Proposed membership (technical experts):
    - ?

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Discussion :

- **Road Research Steering Committee:**
  - Purpose:
    - Provide oversight for establishment of Road Research Centre/Unit
    - Review and endorsement of recommendations of Road Research Technical Committee
    - Identification of funding sources/mechanisms
    - Broad assessment of outputs and outcomes of Road Research Centre/Unit
  - Proposed membership:
    - ?

Annex F: List of research topics concluded (Institute of Engineering, Nepal)

Thesis title
Study of Motorcycle traffic stream characteristics in Kathmandu valley
Effects of fines content on strength behaviour of pavement materials
Non-destructive evaluation of Asphalt concrete pavement in Airfields: A case study of Tribhuvan International Airport
Estimation of work trip mode choice model for public transit captive riders in Kathmandu valley
Modelling pedestrian behaviour at pedestrian crossings: A case study in Kathmandu
Analysis of motorcycle accident cost by willingness to pay method: A case study for Kathmandu valley
Minimum traffic threshold for rural road upgradation: A case study of Terai Road
Air travel demand modelling for Nepal
Signal optimization at isolated intersection by using presignal: A case study of Keshar Mahal intersection
Estimation of Pavement layer moduli and displacements based on optimization techniques using non-destructive test data
Cobble Pavement an alternative pavement option for Rural Road in Nepal
Development of Trip Generation Model: A case study of zones inside the ring road
Prediction of Periodic Maintenance of Bituminous Roads
Suitability test of coarse aggregates for pavement construction from twenty five quarries of central region of Nepal
Economic Analysis of Low Volume Road: A case study of Kalanki Ghyampedol Badvangyang Road
Evaluation of post construction effectiveness of mitigation measures as contained in EMAP for upgrading Kathmandu-Naubise alternative road
Overloading condition and its effect on pavement service life (A case study: Narayanghat-Mungling Road)
Optimization and Priotization of Transport Network: Agricultural Development Perspective (a case study of Sankhuwasabha district)
A study on analysis of transportation network and spatial economy- network influence on urban potentiality
Performance evaluation of pedestrian bridges in Kathmandu
Performance of Otta seal pavement in Nepal: A case study of Anarkholi Satbanjh road
Domestic air passenger demand model for major airports of Nepal
Analysis of IRI value for assessment of optimum maintenance strategy for Low traffic volume roads in Nepal
Maintenance planning of East West highway

Thesis title
Development of an appropriate Traffic Forecasting model in Nepal
Financing airport projects: A PPP approach
Calibration of conventional macroscopoic traffic flow models for Nepalese Roads: (a case study of Jadibuti-Suryabinayak section)
Assigning risk score to bends and devising treatment hierarchy in Dhulikhel-Nepalthok road
Application of Analytical Hierarchic Process in District Road Core Network selection and ranking process for the preparation of District Transport Master Plan: A case study of Bhojpur District
Development of a methodology to prioritize road safety projects based on safety index (a case study of Tansen-Tamghas feeder road)
Traffic Volume prediction model for rural roads: A case study of Western part of Nepal
Development of saturation flow and daily models for signalized intersection in Kathmandu
Risk factor associated with road construction in Nepal; with study technical audit conducted by National Vigilance Centre
Analysis of pedestrian walking speed and flow characteristics at side walkway: A case study of Kathmandu valley
Evaluation of existing level of service of intersection by Simulation Modelling: A case study of Putalisadak Intersection
Identification of Accident prone zone and developing an accident prediction model along Naubise-Mugling section of Prithvi Highway
Analysis of pedestrian crossing speed and estimation of level of service for crosswalk at signalized intersections (A case study of Tinkure-Suryabinayak Road)
Modelling pedestrian road crossing behaviour under mixed traffic condition in Kathmandu
Analysis of traffic volume forecast in road project and time series model
Relevancy of Traffic Impact Assessment (TIA) in Kathmandu valley and appropriate model of carrying out TIA in Kathmandu valley
A study on road roughness condition estimation
Optimization of road network, Agriculture and Construction material perspective: A case study of Makwanpur district
Estimation of pedestrian level of service of sidewalk (A case study of Kathmandu Valley)
The impact of variability of peak hour approach volumes on intersection delay
Modelling dwell time and clearance time of public vehicles at bus bay bus stops of Kathmandu valley
A study on the transportation investment trends in Nepal and Evaluation of desired level of investment
All weather road transport infrastructure and their impact on socio-economic development, a case analysis of Road Sector Development Project of Nepal
Impacts of low bidding by the contractors on serviceability of Strategic roads in Nepal
Analysis of motorcycle use behaviour in Nepal: An application and extension of theory of planned behaviour

Thesis title
Modelling the impact of on street parking on Kathmandu Valley
Study on the effect of bus bays on the curb lane capacity of Kathmandu valley
Development of Accident Prediction Models for Rural Roads of Nepal (A case study of Naubise-Jogimara Section)
Accident Prediction Model for Nepalese Road (A case study of Tinkune Suryabinayak Section)
Comparative Analysis of Effects of Binder on Engineering Properties of Pavement Subbase Material
Covering based Approach for Rural Road Planning
Deriving threshold traffic levels for feeder road upgrading using HDM4
Time based Traffic Signal Coordination: A case study at Ghatthaghar and Naya Thimi Intersections
Impact Strength Analysis of Road Side Crash Barriers (A case study of Malekhu Kurintar Section of Prithvi Highway)
Determination of Pavement Economic Intervention level with Maintenance Option for Bituminous Road using HDM 4
Effect of Road Access in Domestic Economy of Nepal: A case study of Selected Districts
Operational Performance of Public Transit in Kathmandu Valley (A case study of Sajha Yatayat)
The Effect of Music Listening on Break Reaction Time (A case study of Koteshwor-Sallaghari Road Section)
Probabilistic Model to Develop a Decision Support System for Planning Bituminous Pavement
Applicability of the International Roughness Index (IRI) as a Predictor of Pavement Condition Index (PCI)
Multi-Objective Approach to Road Network Optimization: A case of Freight Route in Nepal
Development of Maintenance Management System Applicable to Urban Areas (A case study of Kathmandu Metropolitan City)
Information Management System for Road Maintenance Management of Strategic Road of Nepal
Appropriate Asphalt Mix Design for Nepal
A Study on Impacts of Road Infrastructures on Regional Economy of Developing Nation: A Case study of Nepal
The study of Effect of Humps in Vehicular Movement (A case study of Kathmandu Valley)
Development of Present Serviceability Index (PSI) for Flexible Pavements
Study on Efficiency and Effectiveness of Public Transportation within Kathmandu Inner Ring Road
The Study of Effect of Road Width on Passenger Car Units (PCU) of Vehicles under Heterogeneous Traffic Condition

New proposed topics of study
Impact of secondary dwell time of public vehicles at bus stations: A case study of Nepal Yatayat
a crash frequency prediction model and identification of hazardous site locations: a case study of BP highway
dust suppressant and stablization technique for unpaved roads (lime)
Determining correlation between results and end product specification and method specification, A case study on track bed of E/W Electrified Railway in Nepal
Ground access mode choice for Tribhuvan International Airport
a comparative capacity analysis of multiple lane due to site obstruction (a case study of road segment between Koteshwor and Kalanki)
modelling of route choice behaviour for work trips: a case study for motorcycle riders in the Kathmandu valley
a comparative study of asphalt concrete with different fillers in terms of Marshall stability and flow values
optimal route computation for public transport with minimum traveling time and travel cost: a case study of Pokhara city
using logistic regression to estimate the influence of crash factors on road crash severity in Kathmandu valley
Effect of the aggregate gradation and type on the Marshall Properties of the Asphalt Concrete
Speed prediction model of horizontal curves on rural highway: A case study of naubise jogimara road
reduction on structural thickness of flexible pavement using geogrid reinforcement
Proposing safety measures for reducing fatal crashes in highways of Nepal, a case study from Pathlaiya to Kakarbhitta section
Analysis of pedestrian crash cost by willingness to pay method, a case study of kathmandu valley
Analysis of Cost of Road Traffic crashes in Nepal using human capital approach
analysis of road safety barriers in terms of impact strength and suitability identification
redefining the priority process practiced in DRCN roads by incorporating technical factors (a case study of Lamjung district)
the effect of road on number of air passenger a case study of Jumla to Nepalgunj