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TOWARDS A RURAL ROAD STRATEGY

CONCEPT NOTE

This consultant's report does not necessarily reflect the views of ADB or the Government concerned, and ADB and the Government cannot be held liable for its contents.

Asian Development Bank

ABBREVIATIONS

ADB	–	Asian Development Bank
ARAMP	–	Annual Road Asset Management Plan (Nepal)
CNCPL	–	Comprehensive New Connectivity Priority List (India)
CRRN	–	Core Rural Road Network
CUPL	–	Comprehensive Upgradation Priority List (India)
DDC	–	District Development Committee (Nepal)
DRCN	–	District Road Core Network (Nepal)
DRD	–	Department of Rural Development
DTMP	–	District Transport Master Plan (Nepal)
MOALI	–	Ministry of Agriculture, Livestock and Irrigation
MOBA	–	Ministry of Border Affairs
MOC	–	Ministry of Construction
MOHA	–	Ministry of Home Affairs
MOTC	–	Ministry of Transport and Communications
NRRDA	–	National Rural Road Development Agency (India)
PIU	–	Program Implementation Unit (India)
PMGSY	–	Pradham Mantri Gram Sadak Yojana (rural road program in India)
SDG	–	Sustainable Development Goals
SRRDA	–	State Rural Road Development Agency (India)
TA	–	Technical Assistance
VDC	–	Village Development Committee (Nepal)

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I. INTRODUCTION

1. A large portion of the rural population in Myanmar lacks road access. The Asian Development Bank (ADB) estimates that nearly two-thirds of the rural population are physically isolated during part or all of the year. This includes over nine million people living in villages without any road access, and another eleven million people living in villages with only dry-season road access where access is limited during the rainy season. These people lack proper access to health services, education, employment opportunities, markets, and other services and facilities, limiting their development and that of the country as a whole.

2. The Government of Myanmar considers improved rural road access to be key to developing rural areas and addressing rural poverty and inequalities in the country. This is in line with the 2030 Sustainable Development Goals (SDGs) to which the Government of Myanmar has committed itself. In particular, rural road improvement supports SDG #9 related to building resilient infrastructure. Improved access to services and facilities resulting from rural road development is also expected to support SDG #1 related to poverty reduction, SDG #2 related to hunger reduction, SDG #3 related to improved health, SDG #4 related to improved education, SDG #8 related to improved employment opportunities, and SDG #10 related to reduced inequalities.

Figure 1 Sustainable Development Goals



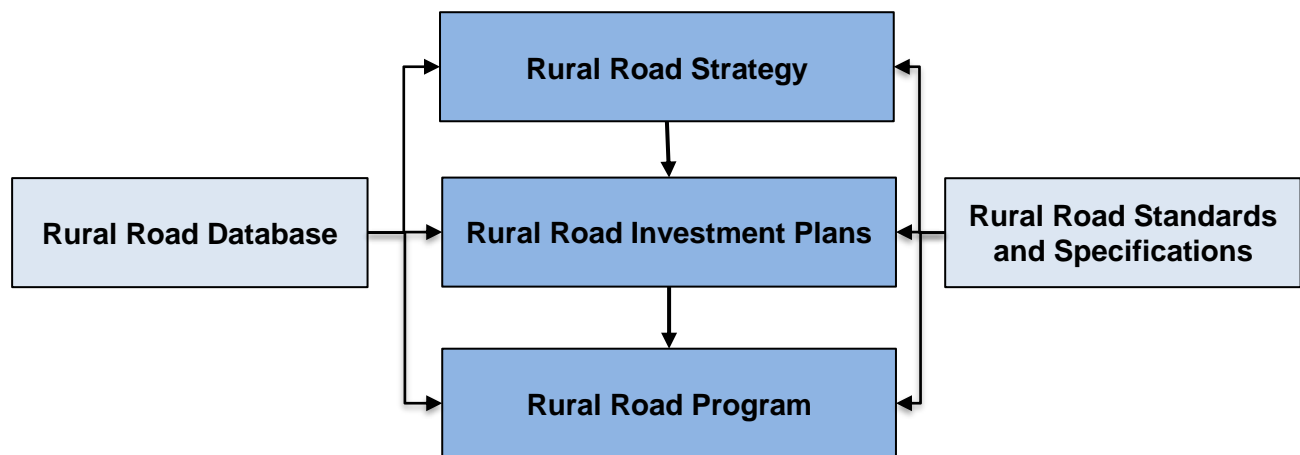
3. The Government of Myanmar has requested support from the ADB for the preparation of a national approach for the improvement of rural road access in Myanmar. Such a national approach will be underpinned by the following pillars:

- **Rural Road Strategy** – The strategy will set the national objectives and targets and define a common approach for rural road investments regarding service levels, planning and prioritization, financing and budget allocation, institutional responsibilities, maintenance and sustainability, and implementation modalities.

- **Rural Road Investment Plans** – The investment plans will identify 1-year, 5-year and 15-year (up to 2030) investment needs and rank these investments based on agreed objective criteria.
- **Rural Road Program** – A national rural road program will potentially be developed as the main instrument for implementing the strategy and investment plans. This would be a centrally managed scheme with dedicated funding (financed by government and development partners) and clearly identified implementation procedures and modalities.

4. These three pillars will be supported by a **Rural Road Database** containing data on the identified Core Rural Road Network (CRRN). The CRRN is the minimum rural road network required to provide the desired levels of access to the rural population in Myanmar (see also section □). The national approach for the improvement of rural road access will also be supported by **Rural Road Standards and Specifications**, which will define the minimum standards to be achieved for CRRN roads. This is reflected in the figure below.

Figure 2 National approach for the improvement of rural road access



5. This concept note forms a first step in the support of the ADB to the development of the national approach for the improvement of rural road access. It focuses on the development of the national Rural Road Strategy for Myanmar.

6. The next chapter looks at the potential contents of the Rural Road Strategy, and some of the main issues to be discussed and agreed upon. Chapter III looks at the different steps to be undertaken in the development of the Rural Roads Strategy, the responsibilities for these steps, and the timeframe for their completion.

II. RURAL ROAD STRATEGY

7. A Rural Road Strategy is a policy document issued by the Government, defining the overall objectives and targets to be achieved in the rural road sector. It forms the framework for all activities related to the rural road network, including the Rural Road Investment Plans and the Rural Road Program that will be developed at a later stage. The Rural Road Strategy is proposed to have the following building blocks that are explained in more detail in the subsequent sections:

- Rural road access
- Objectives and guiding principles
- Standards and specifications
- Planning and prioritization
- Financing and budget allocation
- Institutional responsibilities
- Implementation modalities
- Maintenance and sustainability

8. For each of the sections of the strategy mentioned above, there are a number of issues that need to be discussed and agreed by the government and in consultations with the states and regions, before being finalized. A number of these are mentioned below, with information on how these have been addressed in other countries, specifically India and Nepal which have similar rural road conditions as Myanmar.

A. Rural road access

9. This initial section of the Rural Road Strategy serves as an introduction to the rural road sector and the issue of rural access. It will provide a description of the current status regarding rural roads and rural access. This will make use of government rural road data and the modeling carried out by ADB. To the extent possible, it will make use of more detailed data on rural access obtained from the pilots currently being carried out by DRD in three districts (Hinthada District in Ayeyarwady Region, Myingyan District in Mandalay Region and Langkho District in Shan State) and possibly from other districts as the approach is replicated.

10. This section will show the current status of rural access, and explain the problems caused in terms of access to services and facilities such as health, education, employment, markets, etc. The section will also provide a link to the Sustainable Development Goals, explaining how improved rural road access may support the achievement of these goals.

11. **Roads versus access** – A decision will have to be made whether the strategy will only look at rural roads (possibly including motorable tracks), or take a wider view of rural access. Rural access encompasses rural roads, but also includes other rural transport infrastructure (e.g. footbridges, jetties, waterways, etc.) and rural transport services. The objective is to provide rural access, allowing people to transport themselves and their goods and gain access to services and facilities. Roads are only part of the solution in providing access. A Rural Access Strategy will have a different scope and focus than a Rural Road Strategy.

B. Objectives and guiding principles

12. This is the core element of the Rural Road Strategy. It explains what will be achieved during the period covered by the strategy. Since the strategy will be in support of the Sustainable Development Goals, it will cover the period up to 2030.

13. For the Rural Road Strategy, it is recommended to use an objective along the lines of the following statement:

To connect all eligible villages in Myanmar by all-season road access by 2030

14. **Eligible villages** – It may not be economically feasible to connect all villages. Road connections for very small villages will have a very high per capita cost. It is therefore recommended to limit the eligibility to villages of a certain minimum population size. Such a threshold can also be used to prioritize investments, focusing first on connecting larger villages, and subsequently on smaller villages. Different thresholds may be used for different parts of the country, depending on common village sizes and ease of access. It is possible to apply this criterion to formal villages, or even to informal habitations or settlements. In Myanmar, with its large number of unconnected and relatively small villages, it is recommended to focus on the formal villages, at least initially.

In **India**, the PMGSY program focuses on informal habitations rather than formal villages. The threshold for eligible habitations is set at a minimum of 500 persons in the plains, with a lower threshold of 250 persons applied to hill states, desert areas and tribal areas.

In **Nepal**, rural road sector development is focusing on connecting the village development committees (VDCs – equivalent to village tracts). Village connectivity will only be addressed at a later stage.

15. **All-season road access** – The roads to be constructed should allow for access by motorized vehicles throughout the year. In Myanmar there are issues in providing road access to villages in flood plains and to villages in steep terrain. For these villages (in as far as they are considered eligible as per the definition above), road access may not be (economically) feasible, and other access solutions should perhaps be included (e.g. water transport, motorcycle tracks, footbridges, etc.). This would require a different definition of the objective.

16. **Indicators and targets** – The objective should be accompanied by various indicators and related targets. These may refer to the number or percentage of villages to be connected by dry-season or all-season road, the length of road to be constructed or upgraded, etc. These indicators and targets will allow monitoring of the progress in achieving the objective. In the development of the strategy, the indicators and targets will need to be discussed and agreed upon.

In **Nepal**, the objective is to connect all village development committees (VDC) by all-season road. The indicators being used include the number and percentage of VDCs connected by all-season road, the number and percentage of VDCs connected by dry-season road, and the number and percentage of VDCs that are not connected by road. Additional indicators look at the length and percentage of the district road core network that has an all-season standard and that has a dry-season standard.

C. Standards and specifications

17. This is an important section of the strategy, as it defines the minimum service level or standard of (road) access to be provided. As mentioned above, the objective is to provide all-season road access (this may be expanded to also include non-road access). This section will provide more detail regarding what is understood to be included under all-season road access. This will largely refer to the **Rural Road Standards and Specifications** that will be developed in parallel. However, the strategy will also include a general description of the minimum standards to be applied, and the justification required for applying higher or lower standards in specific circumstances.

18. **Minimum standards** – Although the objective is to provide all-season road access to all eligible villages, this standard should not be set too high in order to limit costs and to allow a larger length of roads to be constructed and a greater number of villages to be connected. In general, the aim should be to provide an unsealed road standard that allows all-season access for motorized vehicles. This requires at the very minimum that proper water crossings and other drainage infrastructure are provided. The standard of these water crossings may vary from all-weather crossings (bridges and slab culverts) to dry-weather crossings (causeways). Slope stabilization may also be necessary in certain areas. Improvements to the road surface will be required in most cases, varying from unsealed gravel or macadam surfaces to sealed penetration macadam, cement concrete or asphalt surfaces. Alternative surface types such as brick or block paving may also be considered. The minimum road width also has an important impact on costs. Single lane roads may be used where traffic volumes are low and passing places are provided. Lastly, the design of the subgrade and base may be simplified to reduce costs, or a stronger design may be used to allow for easy upgrading in the future. These aspects will need to be discussed in detail, to define the minimum standards to be applied in the development of the rural road network. These minimum standards may vary according to the location (depending on local topography, climate and soil conditions) and according to the traffic levels. Improved standards may be applied in specific circumstances (within villages or settlements, on steep slopes, in areas prone to flooding, etc.)

19. **Diverging standards** – The minimum standards may not be (economically) feasible in all cases. In flood prone areas and mountainous terrain, the required minimum standards may not be applicable, especially where the villages to be connected have small populations. In these cases, it may be desirable to apply lower standards, at least for certain sections. This may include footbridges instead of motorable bridges, or motorcycle tracks instead of roads accessible to 4-wheeled vehicles. Clear definitions of such diverging standards and the cases where they may be applied, need to be defined.

20. **Connected versus unconnected** – Villages can have three basic levels of service, including being connected by all-season road, being connected by dry-season road, or being unconnected by road. The difference between all-season and dry season road access will be defined by the Rural Road Standards and Specifications. However, there is also a need to clearly define between villages that are connected by dry-season road and those that are unconnected by road. In the first case, upgrading to all-season standard will be necessary, while in the second case full new construction will be required. This distinction is easy if there is no access at all, or if there is a proper earthen road in place. But it becomes more difficult where there is an existing earthen path or track that is passable by vehicle part of the year, but would require major realignment and widening to the required minimum all-season standard. The strategy will need to define these different service levels, so that it becomes clear whether the required works fall under

upgrading or new construction, and whether a village should be considered to be connected by a dry-season road, or unconnected.

21. As mentioned above, these standards will be described in detail in the Rural Road Standards and Specifications. The Rural Road Strategy will only make general reference to these standards.

D. Planning and prioritization

22. The Rural Road Strategy relates to investments to be made over a period of 15 years, in a portion of the rural road network (only in roads providing connection to eligible villages). Proper planning is therefore important to ensure that investments follow priorities and contribute to achieving the objective and targets.

23. **Core Rural Road Network (CRRN)** – The objective is to connect all eligible villages by road (where feasible). This implies that investments should therefore be focused on connecting the eligible villages. It also implies that once an eligible village has an all-season road connecting it, that additional roads should not be prioritized for investments as such investments would not contribute to the achievement of the objective of connecting all eligible villages (the village concerned is already connected). This has led to the concept of the core rural road network (CRRN). The CRRN can be defined as the minimum road network required to connect all eligible villages. It is based on single road access to all eligible villages. Where there is a single existing rural road connecting an eligible village, this is considered to be a core rural road. Where there is more than one rural road connecting a village, the best road is selected to be the core rural road (this selection may be based on best condition, shortest length, best surface type, most traffic, etc.). The other roads are not considered to be core roads. Where there is no road connecting an eligible village, a tentative alignment may be identified for the new construction of a future rural road – the alignment is then considered to be a planned core rural road. Through this process a complete set of core rural roads can be identified to connect all eligible villages, the core rural road network or CRRN. The strategy will need to define the CRRN concept and how it will form the basis for rural road investments. The strategy will furthermore need to define whether all rural road investments need to be focused only on the CRRN, or whether a certain portion may be allocated to other roads.

In **India**, the PMGSY program has defined the core network as “*the minimal network of roads that is essential to provide basic access to social and economic services to all eligible unconnected habitations through at least single all-weather road connectivity*”. The PMGSY program requires all program funding to be concentrated on the core network. Roads that do not form part of the core network, cannot receive funding under the program.

In **Nepal**, the district road core network (DRCN) is defined as “*the minimum network of rural roads that provides access to all village development committee headquarters and links them (either directly or indirectly) with the district headquarters and the strategic road network*”. The Guidelines for the District Transport Master Plans requires that at least 80% of available funding is spent on the DRCN roads. The remaining 20% may be spent on other rural roads that do not form part of the DRCN.

24. **Construction versus upgrading** – Providing all eligible villages with all-season road access will require both upgrading of existing dry-season roads, as well as new construction. Upgrading will usually involve the construction of improved drainage systems, especially cross

drainage that is passable throughout the year (even though it may be impassable for several hours during rains). It may also include slope protection, and in many cases will include surface improvements. It involves bringing an existing road up to the minimum standard as discussed above. New construction is generally more comprehensive, as it involves full construction or major realignment from an existing track or path. The costs for new construction tend to be significantly higher.

25. The question is whether new construction should be given priority over upgrading. Since new construction involves providing basic access for the first time, while upgrading entails improving existing access, many countries give priority to new construction. This also depends to which standard construction is carried out. Often new construction is considered to be only to dry-season standard, but including all drainage and slope protection works. Surface improvements are done in later years once the road has stabilized, and is carried out under upgrading. The priority may also be absolute (completing all new construction before allocating budget to upgrading), or relative (allocating a certain portion of the funding to construction, and allowing the other portion to be used for upgrading). For Myanmar, where many villages continue to lack road access, it is recommended to prioritize new construction to provide basic access, but allowing a certain portion to be used for the gradual upgrading of existing roads. This means that the first priority is to provide dry-season access, and the second priority is to upgrade this to all-season access. The strategy will need to reflect the relative priorities given to new construction and upgrading.

In **India**, the PMGSY program prioritizes new construction of roads to unconnected habitations. At least 80% of the road length being financed each year should involve new construction, and the remaining 20% of the road length may involve upgrading.

In **Nepal**, priority is currently given to upgrading of existing roads to all-season standard. This was done because many of the existing roads were very poorly constructed and were not passable. The upgrading therefore mainly focuses on improving drainage and slope stabilization. However, after several years up improving such non-engineered roads, it is likely that the approach will be changed to prioritize new construction of roads linking unconnected village development committees.

26. **Village tracts versus villages** – The identification of the core rural road networks in the three pilot districts has shown that, apart from a large number of villages that are not connected by road or only by dry-season road, there are also a number of village tracts that are not connected by road or only by dry-season road. Given that a village tract is an important administrative unit for planning and often provides important local services such as markets, middle and sometimes secondary school education, higher level health facilities, long distance transport services, etc., proper access from these village tracts to the townships, districts and the rest of the country is of high importance. Villagers may be able to travel to the village tracts by walking or using animals or motorcycles, but for further travel they are dependent on there being proper road access. In this sense, many countries have prioritized providing access to village tract level over the provision of access to village level. A decision will need to be taken on how to address this in Myanmar. If priority is given to village tract access, will this be absolute priority (provide access to all village tracts before providing access to villages), or will this depend on other criteria (for instance, by giving a higher weight or score to village tracts, or simply looking at the population served).

In **India**, the PMGSY program ranks the investments based on the size of the habitation, with priority given to larger habitations. No distinction is made between different administrative levels of habitations.

In **Nepal**, priority has been given to providing access to the village development committees that form the lowest level of government (similar to village tracts). The district road core network currently only looks at providing access to village development committees, and most of the rural road sector funding is allocated to these roads. However, there are plans to also define village road core networks to connect the different villages. Where all village development committees are already connected by all-season roads, rural road sector funding may then be allocated to village road core networks.

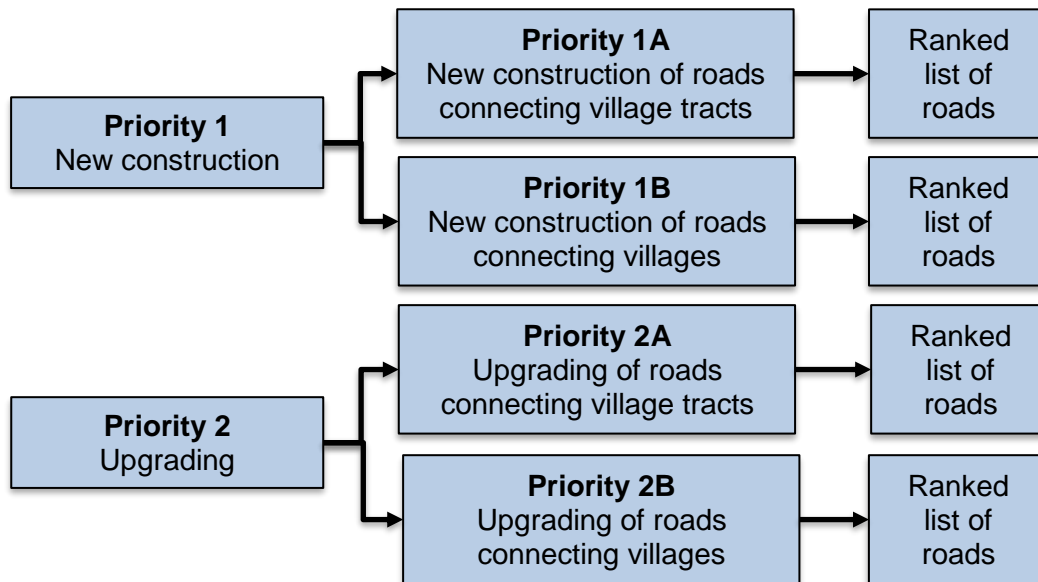
27. **Ranking of roads** – Once the priorities discussed above have been defined, there will still be a list of rural roads requiring investments in each prioritization category (village tract/village, construction/upgrading). These investments will be made over several years, and a ranking of this list of roads is required to determine which roads receive funding first and which roads receive funding later. Considering that all roads on the list have already been determined to be eligible for new construction or upgrading to all-season standard, they will eventually receive funding and the ranking is aimed to determine the order in which they will be funded. It is important to use clear and transparent criteria for ranking. It is also important that roads are developed in a certain order, avoiding that available funds are sprinkled over many different roads. Such sprinkling creates large overheads and severely complicates supervision. The sprinkling of funds also means that a large number of road projects progress very slowly, all being completed at more or less the same date. Focusing funding on priority roads first means that these roads can be completed earlier, while lower priority roads are still completed within the same timeframe. More importantly, supervision is simplified as fewer road projects are ongoing at the same time, resulting in better quality control.

28. Ranking of roads is often on the basis of the population served by the road and the amount of the foreseen investments in the road. In the case of upgrading existing roads, traffic levels can also be used for ranking. The population served by the road can be defined as the entire population of the villages connected by the road concerned (using census data), or the population living within a certain distance of the road (e.g. 5 km). The latter is more complicated to calculate due to the need for more detailed population data. The amount of investment required is generally based on unit costs per mile of road or per foot of bridge. This does not require detailed cost estimates based on bills of quantities. Traffic levels are generally based on very simple traffic counts. A decision will need to be taken on the criteria to be used for ranking roads within the different categories (village tract or village, construction or upgrading).

In **India**, the PMGSY program ranks the investments based on the population of the habitation to be connected, giving priority to larger habitations. A Comprehensive New Connectivity Priority List (CNCPL) is prepared for roads to be newly constructed, where roads are divided into roads connecting habitations with more than 1000 people and roads connecting habitations with 500-1000 people – for hill states, desert areas and tribal areas, a third group of roads connecting habitations with 250-500 people is also included. Within each group, ranking is based on the size of the habitations to be connected. In the case of upgrading, a separate Comprehensive Upgradation Priority List (CUPL) is prepared. Three priority classes are used, including upgrading of drainage in existing unsealed all-season roads, upgrading of unsealed dry-season roads to all-season standard, and improvement of existing roads in poor or very poor condition. Within each priority class roads are ranked on the basis of the population served.

In **Nepal**, the ranking of new construction and upgrading works are based on the cost per person served (dividing the total estimated investment cost by the population served). The population served is defined as the total population of the village development committees served by the road concerned. Roads with a lower cost per person served are given priority, as this allows more people to benefit from a given budget. In the case of maintenance, however, prioritization is on the basis of the cost per vehicle using the road – this is not used for new construction or upgrading as many of these roads are not or poorly passable and traffic volumes do not reflect the importance of the road.

Figure 3 Proposed prioritization categories



E. Financing and budget allocation

29. The strategy will need to pay particular attention to how the achievement of the objective and targets will be funded. This will look at the estimated costs of achieving the objectives and standards, and how these will be financed through different sources of funding. The strategy will describe how the financing is expected to evolve during the strategy period (by year or by period of 5 years). Apart from the amounts and sources of funding, the strategy will also describe how this funding will be divided amongst the different states and regions (in as far as it comes from Union level), and amongst the different districts and townships. Actual allocation to individual roads will follow the ranking described above.

30. **Needs and costs** – The estimated investment costs of achieving the objectives and targets of the strategy will depend on the needs. These needs may be estimated based on modeling, as done by the ADB in the Transport Sector Policy Note. For the strategy, this may be carried out in more detail at a lower administrative level to achieve a more accurate estimation. Where available, this may be complemented by actual need assessments based on the core rural road network (CRRN) identification. This is currently ongoing in three pilot districts, and DRD is planning to replicate this in other districts and townships. Where needs are based on modeling, these may gradually be replaced by results from the CRRN identification as this data becomes available. The estimated construction and improvement needs can be translated into investment needs by using unit costs for new construction and upgrading (average cost per mile for roads

and average cost per foot for water crossings). This may take the form of a Rural Road Investment Plan, with detailed data on needs and costs. Where such detailed information is not yet available, it may be based on more general estimations with general needs and amounts of investment.

In **Nepal**, District Transport Master Plans (DTMPs) were recently been prepared for all 75 districts. The preparation of the DTMPs included the identification of the district road core network (DRCN) and a survey of the new construction needs to complete the DRCN and the upgrading needs to bring the existing DRCN roads to the desired all-season standard. Using unit costs for the different construction and upgrading activities, the investment needs for each district were defined. Using the 75 DTMPs, the total investment need for the country as a whole is being determined.

31. **Sources and amounts of funding** – Based on the estimated investment needs to achieve the objectives and the targets of the strategy, appropriate financing needs to be identified to cover these investment needs within the strategy period. This may involve several different funding sources, which either work in parallel according to similar priorities and plans, or are combined into a single financing modality to fund the approved investment plan. The amount of financing needs to be determined, based on the amounts that are expected to be available from each funding source. The total amount over the strategy period needs to be in line with the estimated investment needs to achieve the strategy objectives and targets. If sufficient financing is not available, the strategy period should be extended or the objectives and targets should be lowered. Alternatively, additional financing should be mobilized from other sources.

32. In the preparation of the strategy, the government will need to see what financing is likely to be available between now and 2030. This may include annual allocations from the Union Budget as well as allocations from the state and regional budgets. State and regional budgets have become very important in recent years, and already finance the majority of trunk road investments, far exceeding union budget allocations to trunk roads. It is expected that the same will happen for rural roads, with possibly a reduction in union funding combined with an increase in state/regional funding. New sources of government funding may also be introduced, including fuel taxes, vehicle fees, or other user charges. Where central and local government budgets are insufficient to achieve the objectives and targets within the desired timeframe, loans and grants from development partners may be used to speed up the development of the rural road sector. The government will need to determine how much it expects to be able to finance from the Union Budget up to 2030, and whether additional user charges may be introduced. The States and Regions will also need to look how much funding they can make available in connecting their villages. And lastly, the amount of funding needed from development partners will have to be estimated. As mentioned, this may need a review of the objectives and targets to ensure that their achievement within the strategy period is realistic.

In **India**, the PMGSY is primarily financed by a fuel tax. Development partners co-finance the program through loans with the aim of speeding up the implementation, although these loans are repaid from the same fuel tax. States co-finance the program through the acquisition of land and the financing of cost overruns. All maintenance is also financed by the states. However, the actual funding flowing through the program is fully centrally financed, and the different funding sources are combined and follow a single set of procedures.

In **Nepal**, several different sources of funding exist for the rural road sector. These include different central government grants as well as district revenues, complemented by different development partner loans and grants. At the district level, these are allocated to the different roads and activities by the District Development Committees (DDCs). This largely follows the budget allocation procedures issued by the central government, as reflected in the District

Transport Master Plans prepared by the DDCs. However, each funding source tends to have additional requirements, and as a result some funds do not fully follow the priorities and plans. Nevertheless, it is a great improvement compared to the situation before where funds were allocated to different roads in a haphazard manner.

33. **Allocation by state/region** – Currently most of the rural road sector funding comes from the Union Budget and centrally managed loans and grants from development partners. The allocation of government funds to the different states and regions follows certain procedures. These will need to be clearly described in the Rural Road Strategy and amended if considered necessary. It is important that the allocation follows objective and transparent criteria aimed at achieving the strategy objectives and targets for the country as a whole. Development partner funding will generally focus on certain states or regions. Here it will be important to ensure an appropriate distribution of development partner funding amongst those states and regions that need it most, supplementing the available union budget funding. As mentioned above, the states and regions will likely start allocating more funding to the rural road network. This funding will stay in the state/region concerned, but needs to be taken into consideration in the allocation of union budget funding and development partner funding. States and regions that are able to allocate more of their own funds, will need less support from central government. In the preparation of the strategy, the procedures for allocation of funds to different states and regions and from the different states and regions themselves will need to be clearly described. This will require an analysis of current procedures, amending these where this is considered necessary.

34. **Allocation by district and township** – Within each state and region, there will be a further need to allocate the available budget to the different districts and townships. This is currently done on the basis of the number of villages. However, in some districts and townships, most villages are already connected, while in others the level of connectivity is very low. It may therefore be desirable to allocate the funding based on the actual needs. This may be on the basis of the number of villages that are unconnected, or the number of people living in these unconnected villages. The allocation may also follow the road ranking and priorities, whereby the road lists are combined for the entire district or even state/region. Given the current structure of DRD and the general desire to ensure a certain degree of funding for all districts and townships, it is recommended to base the funding allocation to districts and townships on the number of people living in unconnected eligible villages. This will ensure that funding is prioritized to those districts and townships where the most people are without road access and where the investments can have the greatest impact. This may be complemented with a certain portion of the funding being allocated based on the number of people in villages that only have dry-season access, thus allowing for the gradual upgrading of these roads. The strategy should define how the budget allocation will be determined.

In **Nepal**, the budget allocation to the different districts varies by funding source. In some cases, the allocation depends on the existing road length, in other cases it depends on other factors such as poverty. The allocation to the different village development committees is on the basis of the road ranking, where the ranking is carried out for all district road core roads in the district. This has caused some disagreement, as some village development committees may not receive any investments in a specific year. This has been addressed by allowing up to 20% of the budget to be allocated to lower priority roads or even to non-core roads. This enables districts to allocate some funding to village development committees that would otherwise have to wait several years before their roads reached the top of the list.

F. Institutional responsibilities

35. In Myanmar there are several different entities involved in the rural road sector. The most important of these is the Department of Rural Development (DRD) under the Ministry of Agriculture, Livestock and Irrigation (MOALI). In some townships, the Ministry of Border Affairs (MOBA) is active in the rural road sector. Township Development Committees under the Ministry of Home Affairs (MOHA) also make some investments in rural roads. Although the Ministry of Construction (MOC) is formally not involved in rural roads, the distinction between rural roads and the district and township roads under MOC is not always clear. District and township roads managed by MOC are also very important in providing rural access, and provide connectivity for many village tracts and villages. MOC is also responsible for setting the standards and specifications for the higher level roads, to which the Rural Road Standards and Specifications will be linked. These different entities generally have representation at different administrative levels. It is therefore important that the strategy clearly defines the roles and responsibilities of the different entities and the different administrative levels in implementing the strategy and achieving the strategy objectives and targets.

36. **Coordination of activities** – Coordination of activities between the different entities in Myanmar is currently lacking in some cases. This may be improved through the creation of an autonomous agency that will become responsible for the rural road sector, instead of the different government entities. This rural road agency would work for the different government entities, and ensure that investments are coordinated. This may include a national rural road agency, as well as rural road agencies at state/regional level. An alternative option is to identify the main entity for each area (district or township) and make this entity responsible for all rural road sector activities in that area, thus also ensuring a coordinated approach within each area. The strategy will need to define how different entities will work together and how their activities may be coordinated.

In **India**, a National Rural Road Development Agency (NRRDA) was created to manage the PMGSY program. At state level, a State Rural Road Development Agency (SRRDA) was created in each state to receive the program funding and make the necessary payments. Within each state, an Executive Agency was also identified, which is a government entity with representation in all districts and with extensive experience in the rural road sector. Where more than one Executive Agency is identified in a state, the division is by district, with each district only having one Executive Agency. The Executive Agency has a Program Implementation Unit (PIU) that is responsible for the implementation of the PMGSY program and is fully accountable to the SRRDA. This approach ensures that all program activities are properly coordinated, with one single line of responsibility.

37. **Plan preparation and approval** – One of the most important aspects of the strategy is the preparation and approval of plans, including the identification of the core rural road network (CRRN). The pilots in the three districts have shown that the township is a suitable level for preparing plans. However, this ideally requires involvement of the village tracts to identify the core rural road networks to connect all eligible villages and to assist in the survey of the new construction and improvement needs. Plans can subsequently be compiled at district level by district level staff. Given that DRD is the main entity active in rural roads, and that it covers all townships, it is recommended that it be made responsible for preparing the plans. In doing so, it should work closely with the township development committees. In townships where MOBA is active, it should also aim to coordinate with them. Although the plan preparation may be carried out by DRD, the involvement of the TDCs and MOBA is especially important in the plan approval.

Their involvement in the plan approval process will ensure that their investments in rural roads will also follow the approved plans. The involvement of MOC in the plan approval process is also recommended, to ensure better coordination between the investments in rural roads, and in the higher level roads that connect with. Lastly, the state and regional parliaments (hluttaws) should be involved in the final approval process, especially of the CRRN and of the longer term investment plans.

In **Nepal**, the District Transport Master Plans have been prepared by national consulting firms under several rural road projects financed by different development partners. The plans prepared by the consultants in coordination with district engineers, were presented to the District Development Committees (DDCs) and the local representatives of the different political parties for approval. In Nepal the Local Self Governance Act gives the districts the power to decide about investments in local roads, and the DDCs are the highest body for approval. Information on the approved plans is subsequently sent to the Ministry of Local Government and Federal Affairs and to the Roads Board Nepal for information and as a basis for funding.

In **India**, the core network and the district rural roads plans are prepared at Block level. The plans are subsequently presented to the Intermediate Panchayat (revenue village) level for approval, and to the Members of Parliament for comments. The next step is approval by the District Panchayat. A copy of the approved plan is sent to the state level road agency and to the National Rural Road Development Agency (NRRDA) for information. Under the PMGSY program, roads can only be funded if they are included in the core network approved by the different levels.

38. **Financing** – Financing is another important role. It is expected that financing will mainly come from central level and state/regional level, although some funding may be allocated at township level by the TDCs. Central level funding for rural roads currently comes from MOALI (DRD) and MOBA, and in exceptional cases from other ministries (either financed from the union budget or from development partner loans and grants). In the preparation of the strategy, it will be important to clarify which of these funding sources will be allocated to the achievement of the strategy, and will follow the procedures defined in the strategy. The strategy should also clearly define this.

In **India**, the guidelines for the PMGSY program explain that new construction and upgrading works under the program are to be financed from central level program funding. However, all land acquisition, cost overruns and maintenance are to be financed by the states.

39. **Procurement** – Rural road works financed through DRD are currently carried out by the private sector, and procured through competitive bidding. It is recommended that this practice be continued. It is not fully clear how works financed by MOBA and the TDCs are procured. It is recommended that all funding sources apply the same approach and procedures, at least in as far as they follow the rural road strategy. The strategy should clearly define the procurement procedures to be followed. This may include specific standard bidding documents to be used, approved by all entities involved and usable in works financed by development partners. It may also include the publication of tenders on a website, together with the results of the tender evaluation and contract award. It may furthermore involve requirements regarding the placement of signposts along the roads concerned informing local people of the details of the contract. The government will need to discuss how it would like the procurement of rural road works to take place and how this should be reflected in the strategy. The strategy should further explain at which level procurement will take place – whether this will be done at state/regional level, allowing for the creation of a skilled procurement unit, or at district level.

40. **Supervision and quality control** – In rural roads, proper supervision and quality control is always a challenge due to the large number of roads involved and the fact that they are dispersed over a large area. The limited skills, experience and equipment available at local level can also form a difficulty. It is therefore recommended to introduce quality control procedures with involvement from different levels. Day-to-day supervision and quality control should be carried out at local level, with quality control laboratories set up by the contractors. This should be complemented by periodic quality control visits from higher level at regular intervals, which will allow a more independent assessment of quality by a dedicated quality control unit based at the state/regional level. This unit should visit all projects at least once during implementation. Lastly, there should be a quality assurance unit that will carry out visits to a sample of projects with the aim of confirming that quality control is being properly carried out.

41. The day-to-day supervision may be carried out by DRD staff at township and district level – in the case of MOBA financed works, this may be done by MOBA staff. For the quality control unit, it is recommended to have a dedicated unit at state/regional level. This could be under the state/regional government, and financed/hired by DRD and MOBA for the quality control of their respective roads. This service could also be provided by the private sector. Ideally, this unit should not differentiate between the source of funding for the roads concerned. The quality assurance unit should be placed at national level. Ideally this would be placed under an entity encompassing all rural road sector activities (e.g. a national rural road agency). However, in the current structure this may best be placed under DRD, since this entity has the widest coverage of the rural road sector.

In **India**, the PMGSY program applies a three-tier quality control structure. The first level is the quality control through day-to-day supervision by the program implementation units under the Executive Agency at district or state level. This is complemented by quality control laboratories that the contractors are required to set up. The second tier is a quality control unit at state level that carries out quality control inspections on a periodic basis. This may be a government unit or a private company, but is independent from the Executive Agency and the PIU. The third tier involves random sampling by the National Rural Road Development Agency of road projects financed through the PMGSY. For this purpose, NRRDA hires individuals or entities that are fully independent. Their function is to carry out quality assurance and to check that the quality control is being properly carried out.

42. **Monitoring** – In the implementation of a strategy, proper monitoring is required to assess the progress in achieving the objectives and targets of the strategy, allowing amendments to be made where necessary. Given the large number of projects and the wide area involved, this should ideally be an online system where data can be entered at the local level, and can be reviewed and analyzed at the state/regional and central level. Such a monitoring system should be directly linked to the Rural Road Database, ensuring that both have the same data. The strategy should define how such a monitoring system would work, and who would be responsible for managing and updating the system.

G. Maintenance and sustainability

43. Construction and upgrading of the rural road network will only provide temporary access improvement, unless proper maintenance is ensured to make the access improvements sustainable. Maintenance is often a weak area in rural road programs and strategies, and it is important that the Rural Road Strategy for Myanmar properly describes how maintenance will be carried out and financed. This should differentiate between routine maintenance that is carried

out on a more or less continuous basis, and periodic maintenance that is carried out with intervals of several years. In some cases, rehabilitation may also be necessary, although proper timing of maintenance can significantly reduce the need for rehabilitation.

44. **Routine maintenance** – Routine maintenance includes activities like the clearing of the drainage system to allow water to flow away from the road without causing damage, removal of landslides, small repairs to the road surface, etc. Mostly it involves activities aimed at avoiding damage to the road, or repairing minor damages to the road before they become larger. These are activities that need to be carried out throughout each year (the volume and type of activities may vary according to the season). Many of the activities can be carried out by unskilled workers with minimal training. As such, these activities can easily be contracted out to local people living along the roads concerned. These people may be contracted under community contracts (through village authorities or other organizational groupings), as road maintenance groups (where specific people are contracted to carry out the activities) or through contractors. Combinations of these contracting modalities are also possible (e.g. a maintenance contractor who subcontracts road maintenance groups for off-carriageway maintenance). Although the local people are more than capable of carrying out most routine maintenance works, repairs to sealed pavements and concrete structures are best contracted out to contractors having the required skills and equipment. This may be done as a separate contract or combined with the off-carriageway maintenance. The strategy will need to describe the preferred options for contracting out routine maintenance of rural roads, making a distinction between unsealed roads, sealed pavements and structures. The strategy will also need to look at the possible basis for payments, including input-based payments (based on days worked), volume-based payments (using bills of quantities) or performance-based payments (based on resulting road conditions). Each has its advantages and disadvantages depending on the type of activities, type of roads and type of implementation involved.

In **Nepal**, routine maintenance of rural roads is carried out by road maintenance groups (RMG). These were first introduced in 2009, and have since been replicated in several development partner funded projects. The Department of Local Infrastructure Development and Agricultural Roads (DOLIDAR) has recently issued RMG Guidelines for use in all rural roads. The RMGs are made up of local women and men who carry out routine maintenance activities and minor repairs on a continuous basis. They are paid a monthly lumpsum on a performance basis. This means that if the road does not comply with the defined performance standards, that they are given a deduction to their monthly payment. The number of days worked or the volume of work completed are not measured. This reduces the time spent on inspections by the district engineers.

In **India**, The PMGSY program issues 5-year maintenance contracts as part of the new construction and upgrading contracts. The contractor awarded the contract is then responsible for carrying out routine maintenance for 5 years after completion of the construction or upgrading works. After the 5-year period, new maintenance contracts are tendered out for a new period of 5 years.

45. **Periodic maintenance** – Periodic maintenance involves grading, regravelling, comprehensive repairs to macadam pavements, overlays, etc. These maintenance activities are carried out with intervals of several years, and are completed within a short time. This makes them more suitable to volume-based contracting (using bills of quantities). The type of works also requires some skills and equipment. As a result, these works are generally contracted out to contractors. However, the scope of works is very different from construction and upgrading, and adjusted contracts are often used. The periodic maintenance can also be combined with routine

maintenance for several years in one single contract. The strategy will need to define how periodic maintenance is carried out.

In **India**, the PMGSY program initially awards a contract that combines new construction or upgrading with 5 years of routine maintenance. After this period, new maintenance contracts are issued. This is often combined with a cycle of periodic maintenance during the contract period.

In **Nepal**, periodic maintenance is contracted out to contractors on a volume basis. Routine maintenance of rural roads is carried out by road maintenance groups, and with intervals of several years, periodic maintenance is carried out by contractors under a separate contract.

46. **Maintenance planning and prioritization** – Maintenance funding is generally limited and does not allow all maintenance needs to be addressed. As a result, it will be necessary to prioritize certain maintenance needs that will receive funding. This requires proper planning to identify the different maintenance needs, as well as a set of transparent prioritization criteria to rank the different roads and their maintenance needs. In Myanmar, as in many other countries, there is a tendency to prioritize the repair of roads in poor condition over the maintenance of roads in good/fair condition. This means that the available maintenance funding is concentrated in a short length of road requiring significant repair, while the rest of the network is allowed to deteriorate unchecked. Instead it is preferable to first ensure the maintenance of roads in good/fair condition, avoiding damage from occurring. The low cost of such maintenance allows a far greater portion of the network to be covered and kept in good/fair condition. The roads in poor condition can then gradually be repaired using the remaining budget, ensuring that these are covered by maintenance as soon as they are improved. The strategy should clearly define the procedures in preparing annual maintenance plans and prioritizing the maintenance activities that will receive funding. This should give priority to maintenance over repair, and define criteria for determining the importance of roads.

In **Nepal**, Annual Road Asset Management Plans (ARAMP) are being piloted in some districts. These define the maintenance works, as well as the construction and improvement works to be carried out during the year (the latter are copied from the District Transport Master Plans). The preparation of the ARAMP involves a rapid survey of the district road core network after the rainy season to identify the maintenance needs. These are then translated into estimated investment needs based on unit costs. In the allocation of the maintenance budget, priority is given to emergency maintenance, followed by routine maintenance and minor repairs, specific maintenance (spot improvements) and finally periodic maintenance. Within each maintenance type, the investment needs are ranked on the basis of the cost per vehicle (dividing the total cost of maintenance by the traffic volume of the road concerned). This ensures that maintenance funding is allocated to the roads with the most traffic, and that priority is given to preventing damage over repairing damage.

47. **Maintenance funding** – Although the importance of maintenance may be clear, funding for maintenance is often lacking. A budget line for rural road maintenance was only introduced in DRD's budget in 2015. Without secured and predictable maintenance funding, maintenance is not carried out, or not in a timely manner, resulting in accelerated deterioration of the roads and increased repair costs later on. The strategy will need to define how rural road maintenance will be financed. This includes the amount of funding to be provided to maintain the rural road network. This may be based on average unit costs per kilometre per year, where the unit costs may vary according to the surface type and the area concerned (depending on topography, climate, etc.). The strategy also needs to define where this funding should come from. This may be from the

state/regional level, making each state/region responsible for maintaining their rural roads, or from the central level. If new user charges are introduced, these may also fund rural road maintenance. A combination of different sources is also possible.

In **India**, the PMGSY program finances new construction of roads to link unconnected habitations, as well as upgrading of important core roads. However, maintenance is not funded by the program, and the states are required to finance this. As part of the construction and upgrading contracts, the contractor is required to maintain the road for 5 years. The costs of this maintenance are financed by the states. The states are also responsible for financing subsequent maintenance contracts.

In **Nepal**, the districts are prone to spend available funding on new construction and upgrading. Very little attention has been given to maintenance, as the district authorities receive a lot of pressure from the villages to improve connectivity. As a result, many roads constructed and upgraded with central government funding or by development partner projects in the past, have rapidly deteriorated due to a lack of maintenance. This has seen a shift in central government and development partner funding towards maintenance, with the aim of developing a proper maintenance regime and securing the investments made in construction and upgrading in the past. Rural road maintenance now receives funding from several government and development partner projects, as well as from the Roads Board Nepal (road fund).

III. STEPS AND TIME SCHEDULE

48. In the preparation and approval of the Rural Road Strategy, there are several steps to be undertaken. The table below lists the 10 steps required to go from this initial concept note to the final approval of the strategy. This involves several rounds of preparing and updating draft strategy documents and discussing these with gradually expanding audiences (first only DRD, then other central government entities and development partners, and lastly the state/regional governments and local authorities). The schedule below is planned quite tight with the aim of getting the strategy approved by the end of the current fiscal year.

Figure 4 Time schedule for preparation of the Rural Road Strategy

Step	Responsible	2016					2017		
		A	S	O	N	D	J	F	M
i. Prepare concept note for Rural Road Strategy	ADB								
ii. Discuss main issues to be included in Rural Road Strategy	DRD								
iii. Prepare zero draft of the Rural Road Strategy	ADB								
iv. Review and discuss zero draft of the Rural Road Strategy	DRD, ADB								
v. Prepare first draft of the Rural Road Strategy	ADB								
vi. Review and finalize draft Rural Road Strategy	DRD, ADB								
vii. Present draft Strategy to central government and development partners	DRD, ADB								
viii. Finalize draft Rural Road Strategy	DRD, ADB								
ix. Consult state/regional and local level regarding Rural Road Strategy	DRD, states & regions								
x. Finalize and approve Rural Road Strategy	MOALI, MOBA, MOC, parliament								

49. **Step 1: Prepare concept note for Rural Road Strategy** – This step involves this concept note prepared by the ADB TA-team. This serves to propose the contents of the Rural Road Strategy and identify the main issues of the strategy to be discussed and agreed upon by DRD. The concept note also proposes the time schedule to be followed in the preparation of the strategy. The concept note will be provided to DRD by the 15th of August 2016.

50. **Step 2: Discuss main issues to be included in Rural Road Strategy** – The next step is for DRD to review this concept note. DRD will need to review the proposed contents of the strategy and identify any other aspects to be included. It must be noted that the strategy should be kept as simple as possible in order to facilitate its approval by central and state/regional governments. Inclusion of too much detail may complicate this process and delay approval. Such details are best included in other documents and referred to in the strategy.

51. DRD will also need to discuss in detail the main issues identified in this concept note. This may be an internal review and discussion, but may also involve other government entities involved in the rural transport sector such as MOBA, MOC and MOTC. DRD will need to determine

how it wishes to address each of the identified issues in the strategy. In doing so, it may refer to the experiences of India and Nepal described in this concept note. The ADB TA-team will be available to provide further support and explanation where necessary. DRD will provide feedback to the ADB TA-team regarding the decisions made for each of the issues, allowing the TA-team to incorporate these into the draft strategy. These decisions may be discussed further between DRD and the ADB TA-team.

52. DRD will also review the proposed steps and time schedule and provide feedback regarding any changes or additions. It is expected that the complete review will take at least two weeks, and that the full feedback will be received between 1-15 September 2016.

53. **Step 3: Prepare zero draft Rural Road Strategy** – Once the feedback regarding the contents of the strategy and the decisions regarding the main issues identified in this concept note have been received, the ADB TA-team will prepare the zero draft of the Rural Road Strategy. This will be a very rough draft and is meant as a basis for initial discussions with DRD on the detailed contents, so that any changes and adjustments can be made at an early stage. The preparation of the zero draft of the strategy will take at least two weeks from the moment of receiving the feedback from DRD, and is therefore expected to be completed between 15-30 September 2016.

54. **Step 4: Review and discuss zero draft Rural Road Strategy** – The zero draft will need to be reviewed by DRD. It is recommended that this include a meeting between DRD and the ADB TA-team to review and discuss the zero draft and confirm the amendments and additions to be made. This review meeting will be held towards the end of September or early October.

55. **Step 5: Prepare draft Rural Road Strategy** – Once the zero draft has been reviewed and detailed comments have been received from DRD, a first full draft will be prepared. This will be a complete draft of the Rural Road Strategy. It will be prepared and sent to DRD by mid-October 2016.

56. **Step 6: Review and finalize draft Rural Road Strategy** – DRD will review the first draft and send any comments to the ADB TA-team for incorporation into a second draft of the Rural Road Strategy. The second draft of the Rural Road Strategy will be prepared towards the end of October 2016.

57. **Step 7: Present draft Strategy to central government and development partners** – The second draft of the Rural Road Strategy will be shared with other government entities and development partners active in the rural road sector. A workshop will be organized to present the draft strategy and to discuss this with the other government entities and development partners. This is expected to involve MOALI (DRD), MOBA, MOC, and MOTC, as well as ADB, KfW, JICA and World Bank. During the workshop, comments will be received and discussed, and minutes will be prepared regarding the changes to be made to the draft strategy. The workshop will be organized in the first half of November 2016.

58. **Step 8: Finalize draft Rural Road Strategy** – Based on the feedback received from the workshop participants, a final draft of the Rural Road Strategy will be prepared by the ADB TA-team and shared with DRD for review. The final draft of the strategy will be made available and approved by DRD before the end of November 2016.

59. **Step 9: Consult state/regional and local level regarding Rural Road Strategy** – The next step in the approval process will be a series of consultations in the states and regions with

state/regional governments and district authorities. Consultations will be organized by DRD in each state and region, as well as in a sample of districts. The consultations will present and discuss the proposed Rural Road Strategy and collect feedback from the state and regional governments and other representatives. The feedback from the different states and regions will be collected and merged by DRD. The consultation workshops will be carried out between December 2016 and February 2017.

60. **Step 10: Finalize and approve Rural Road Strategy** – Based on the feedback received from the consultation workshops, the Rural Road Strategy will be adjusted and finalized. The final Rural Road Strategy will go through the process of approval by the relevant ministries (MOALI, MOBA, MOC, MOTC?) and possibly the parliament. The exact format of the approval process has yet to be defined. Approval will be sought to be completed before the end of the fiscal year, allowing the new strategy to be applied from the 2017-2018 financial year onwards.

61. **Timeframe** - The proposed timeframe may be amended based on the availability of more detailed data regarding the core rural road network identification in the different districts and townships. Where this is foreseen to be completed within a reasonable timeframe, the finalization of the strategy may be postponed in order that this data may be incorporated and used to determine more accurate targets.