

Government of the Republic of the Union of Myanmar

National Strategy for Rural Roads and Access (NSRRA)

ZERO DRAFT

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**Ministry of Agriculture,
Livestock and Irrigation**



**Ministry of
Border Affairs**



**Ministry of
Construction**

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Acronyms and abbreviations

DOB	Department of Bridges
DOH	Department of Highways
DRD	Department of Rural Development
MOALI	Ministry of Agriculture, Livestock and Irrigation
MOBA	Ministry of Border Affairs
MOHA	Ministry of Home Affairs
MOC	Ministry of Construction
MOTC	Ministry of Transport and Communications
NRRA	National Rural Road Agency
SDG	Sustainable Development Goals
TDC	Township Development Committee
VDC	Village Development Committee

1. Introduction

1. Approximately 4.5 million rural people in Myanmar are estimated to live in villages that are not connected by roads. An additional 14 million rural people are estimated to live in villages that are connected only by dry-season roads that often become impassable in the rainy season. As a result, over half the rural population in Myanmar is physically isolated during part or all of the year. 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 roads and 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), which the Government of Myanmar has committed itself to achieving. In particular, rural road development and the resulting improved access to services and facilities are expected to support the following SDGs:

- **SDG #1 related to poverty reduction** – Rural roads have been proven to provide access to employment opportunities outside the villages, while also providing access to markets for selling produce and purchasing inputs, and facilitating access to education to improve future income earning opportunities.
- **SDG #2 related to hunger reduction** – Rural roads have been proven to lead to higher incomes and related food consumption, while also facilitating access to knowledge and inputs necessary for increasing agricultural produce.
- **SDG #3 related to improved health** – Rural roads have been proven to provide access to health facilities and services and to health education, leading to improved health standards in rural areas.
- **SDG #4 related to improved education** – Rural roads have been proven to facilitate year-round access to education facilities, reducing the costs and difficulties of obtaining an education and reducing drop-out rates.
- **SDG #8 related to improved employment opportunities** – Rural roads have been proven to increase and facilitate access to employment opportunities outside the village, as well as increasing income earning opportunities within the village.
- **SDG #9 related to building resilient infrastructure** – Rural roads are increasingly being built to an all-season standard that provides year-round access, while sustainability is ensured through appropriate designs and proper maintenance.
- **SDG #10 related to reduced inequalities** – The increased access to services and facilities resulting from rural roads has been proven to lead to a reduction in inequalities between (remote) rural areas and the rest of the country.

Figure 1 Sustainable Development Goals



2. Objectives and guiding principles

3. In support of the Sustainable Development Goals (SDGs), the Government of Myanmar aims to improve the access of the rural population to services and facilities by providing rural villages with road access. To ensure that rural people are able to make use of this improved access throughout the year, the rural roads are to have an all-season standard. Specifically, the development objective of this National Strategy for Rural Roads and Access (NSRRA) is as follows:

Figure 2 Development Objective

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

4. **Eligible villages.** The Government of Myanmar aims to connect all villages that have been formally registered by the General Administration Department (GAD) in the Government Gazette, or by humanitarian and development organizations. As of March 2015, there are 70,838 villages spread over the 330 townships and 74 districts that make up the 14 States and Regions, the Union Territory of Naypyitaw and the 5 Self-Administered Zones (SAZ) and 1 Self-Administered Division (SAD).

3. Rural road standards and specifications

5. **All-season standard.** The Government of Myanmar aims to provide all registered villages with road access of an all-season standard. Such an all-season standard is different from an all-weather standard, as the road may still be closed during rains or periods of flooding. However, such closures are generally limited to 1-2 days maximum, as opposed to a dry-season road that is impassable for much of the rainy season.

6. **National Rural Road Standards and Specifications.** The specifications of the all-season standard are defined in detail in the *National Rural Road Standards and Specifications* (NRRSS) and are summarized below. Where there is a difference between this strategy and the NRRSS, the NRRSS has precedence.

7. **Surface type.** A road with an all-season standard has an improved, unsealed road surface, allowing it to be used in most weather conditions and throughout the year (roads may be impassable during heavy rains and periods of flooding, but this should generally not last longer than 1-2 days at the maximum). Where traffic volumes grow and exceed a certain minimum threshold, a sealed surface is required. In areas subject to frequent flooding, flood resistant materials should be used. On steep slopes, erosion resistant materials should be used. In built-up areas (through villages), roads may be sealed to reduce dust pollution.

8. **Carrying capacity.** The all-season road standard will have a proper base and subbase, and will have a minimum carrying capacity of 20 tons. Where traffic volumes grow and exceed a certain minimum threshold, the carrying capacity of the road will be according to AASHTO HS20-44 standard.

9. **Carriageway width.** The all-season standard road will have a minimum carriageway width of 12 feet. Where traffic volumes grow and exceed a certain minimum threshold, the width of the carriageway should be increased to at least 18 feet. Where topography requires significant cut and fill to achieve the defined carriageway width, a narrower carriageway width with single lane access of 6 or 9 feet may be opted for, ensuring sufficient passing places.

10. **Drainage system and bridges.** The all-season road standard will include proper sidedrains and cross drainage. Sidedrains may be earthen, but must be lined where the risk of erosion is high.

Cross drainage structures, including bridges, will be built of cement concrete or steel and have a load bearing capacity of at least 13 tons. Where traffic volumes are expected to grow and exceed a certain minimum threshold within the next 20 years, a load bearing capacity in line with AASHTO HS20-44 standards should be applied. Timber structures may only be used as temporary measures.

Table 1 All-season rural road standards

	Surface type	Road carrying capacity	Carriageway width	Side drains	Bridges	Bridge carrying capacity
Basic standard	Improved, unsealed surface	20 tons	12 feet	Earthen	Steel / concrete	13 tons
Traffic > threshold	Sealed surface	AASHTO HS20-44 (36 tons)	18 feet			AASHTO HS20-44 (36 tons)
Exceptional cases	Sealed surface		6 or 9 feet	Lined	Timber (temporary)	

11. **Alternative access solutions.** Although it is the objective of the Government of Myanmar to connect all registered villages by all-season road, exceptions may occur where all-season road access is found to be economically unviable. This may be the case for exceptionally small villages with very few beneficiaries, or where the terrain makes the construction of all-season roads prohibitively expensive (for instance in very steep terrain or in flood prone areas). In these cases, alternative access solutions may be selected in negotiation with the population. Such alternative access solutions may include jetties and dredged channels for water transport, improved tracks for motorcycle access, etc.

4. Rural roads and access

12. **Rural roads.** As per August 2016, there are just under 53,000 miles of rural roads in Myanmar, jointly managed by the Department of Rural Development (DRD) under the Ministry of Agriculture, Livestock and Irrigation (MOALI) and by the Ministry of Border Affairs (MOBA). Just over 5% of the rural road network has a sealed cement concrete or bituminous surface, while over 22% has an improved dry-bound macadam, gravel or laterite surface, resulting in nearly 28% of the rural roads being passable all year-round.

13. The remaining rural roads are earthen roads, tracks and paths that are only passable in the dry season. This includes 28% of the rural roads that are earthen roads with a width of 18 feet or more, as well as over 23% that have a width of 12 feet, and 10% with a width below 12 feet. In addition, 11% of the registered rural road network involves substandard jeep and motorcycle tracks, ox-cart tracks and footpaths (this involves three-quarters of the registered rural road network in Chin State).

Table 2 Rural road lengths by surface type (miles)

State/Region or Self-Administered Zone/Division	Cement concrete	Bituminous	Macadam	Gravel	Earthen ≥18ft	Earthen <18ft	Tracks / paths	Total
Naypyitaw	4	57	132	296	281	391	428	1,591
Kachin	2	94	278	142	339	1,173	-	2,028
Kayah	7	29	118	1	24	195	-	374
Kayin	11	69	209	319	191	341	-	1,140
Chin	-	19	63	-	1,630	-	5,292	7,003
Sagaing	16	229	898	551	2,493	1,948	-	6,135
Tanintharyi	19	201	392	-	386	1,127	-	2,124
Bago	25	131	525	1,095	671	1,766	-	4,214
Magway	3	107	718	655	1,604	2,636	40	5,765
Mandalay	6	332	1,280	558	1,025	1,435	-	4,636

State/Region or Self-Administered Zone/Division	Cement concrete	Bituminous	Macadam	Gravel	Earthen ≥18ft	Earthen <18ft	Tracks / paths	Total
Mon	29	156	91	175	336	53	-	839
Rakhine	56	43	520	-	571	440	-	1,629
Yangon	383	51	23	182	199	733	-	1,571
Shan	-	236	1,269	46	2,130	3,092	-	6,773
Ayeyarwady	215	31	691	119	1,667	686	-	3,408
Pa'O SAZ	-	86	210	-	522	307	-	1,124
Palaung SAZ	-	45	131	-	169	110	-	455
Danu SAZ	1	56	85	-	320	-	-	461
Kokang SAZ	-	53	71	-	145	-	-	268
Wa SAD	-	18	26	-	100	-	-	144
Naga SAZ	-	1	17	-	-	1,214	-	1,232
Total	775 1%	2,042 4%	7,747 15%	4,140 8%	14,803 28%	17,647 33%	5,762 11%	52,914 100%

SAZ: Self-Administered Zone, SAD: Self-Administered Division

14. **Rural bridges.** There are currently over 23,000 bridges and causeways in the rural road network, spanning a total length of over 575,000 feet. Bailey bridges make up a third of the total number and nearly half the total length, followed by concrete bridges that make up a quarter of the number and length. Box culverts make up 40% of the number, but only 11% of the length. Causeways are becoming increasingly important, forming 10% of the total length.

Table 3 Rural bridge data

State/Region or SAD/SAZ	Concrete bridge		Bailey bridge		Causeway		Suspension bridge		Other		Total	
	#	feet	#	feet	#	feet	#	feet	#	feet	#	feet
Naypyitaw	23	1,229	58	5,479	11	718	129	678			221	8,104
Kachin	176	3,498	282	10,977	1	400	149	2,426			657	27,947
Kayah	176	2,933	175	3,654	25	744	250	1,471	2	2,925	628	11,727
Kayin	402	10,601	88	3,473			415	2,610			905	16,684
Chin	10	950	124	10,598	1	140	246	9,049	3	220	459	36,727
Sagaing	464	12,303	1,387	62,539	251	12,990	630	3,194			2,732	91,026
Tanintharyi	137	7,833	382	10,806			285	1,542			804	20,181
Bago	461	10,163	976	33,911	21	625	951	5,000	10	1,122	2,419	50,821
Magway	205	5,130	312	13,316	206	16,144	546	3,602	22	4,072	1,299	45,334
Mandalay	386	8,095	496	17,482	230	22,895	755	4,174	17	5,065	1,884	57,711
Mon	689	19,254	188	5,873	30	244	408	2,272			1,315	27,643
Rakhine	639	17,982	300	7,201			1,269	6,131			2,208	31,314
Yangon	281	9,390	170	7,975			369	3,197	6	1,110	826	21,672
Shan	352	6,655	1,031	19,622	63	358	846	4,022			2,293	30,797
Ayeyarwady	447	23,910	592	36,627	6	280	1,042	5,834	6	721	2,094	67,692
Pa'O SAZ	267	3,770	531	3,480	3	44	157	845			958	8,139
Palaung SAZ	32	951	17	502			96	562			145	2,015
Danu SAZ	184	1,422	113	796			72	560			369	2,778
Kokang SAZ	155	3,400	17	350			282	1,410			454	5,160
Wa SAD	14	624					121	631			135	1,255
Naga SAZ	28	1,054	65	4,112			316	6,338			409	11,504
Total	5,528	151,147	7,304	258,773	848	55,582	9,334	65,548	66	15235	23,214	576,231

SAZ: Self-Administered Zone, SAD: Self-Administered Division

15. **Rural access.** The rural roads and bridges are but a means to an end, the end being to provide rural people with access to services and facilities, allowing them to develop and improve their livelihoods. A significant portion of the rural population in Myanmar still lacks road access, while many other rural people face physical isolation during part of the year when dry-season roads become impassable due to rains and flooding.

16. Concrete data on access levels is not yet available in Myanmar. However, a study was carried out in 2016 in three districts (14 townships) that represent the three main geographical zones in Myanmar: Hinthada district in Ayeyarwady Region representing the delta zone, Myingyan district in Mandalay Region representing the dry zone, and Langkho district in Shan State representing the hill zone. The data collected in this study show the following:

- **Delta zone** – An average of 94% of villages in Hinthada district are connected by road, including 14% of villages that are directly connected by trunk roads managed by the Ministry of Construction (MOC) and the Irrigation Department (ID). Many of the rural roads in the district are narrow tracks of 3-6 feet. The unconnected villages are generally located in flood prone areas and small islands where road connectivity is very costly. In the rainy season these unconnected villages use water transport, and in the dry season temporary earthen tracks are constructed.
- **Dry zone** – An average of 70% of villages in Myingyan district are connected by road, including 12% of villages that are directly connected by trunk roads managed by MOC. The rural roads in the district are generally 12 feet or wider. The unconnected villages tend to be located in flood prone areas along rivers or are connected only by rough tracks.
- **Hill zone** – An average of 88% of villages in Langkho district are connected by road, including 27% of villages that are connected directly by trunk roads managed by MOC. The percentage of connected villages is higher as the topography forces villages to be located closer together in the valleys and flat areas, with many villages connected by roads managed by MOC. The unconnected villages are often smaller remote villages.

17. Using the results of this study and extrapolating to the rest of the country based on the geographical zones, it is estimated that approximately 13,000 villages in Myanmar lack road access (18% of all villages in Myanmar). Of the connected villages, it is estimated that just over half are connected only by dry-season earthen roads (approximately 30,500 villages), a quarter are connected by all-season rural roads (approximately 14,500 villages) and just under a quarter are connected directly by roads managed by MOC and ID (approximately 12,500 villages).¹

18. Villages connected directly by trunk roads managed by MOC or by all-season rural roads tend to have a larger population, while those still lacking road access tend to have a small population. The study assumes a linear distribution of the rural population over the different villages, with the smallest villages having 50% of the average village population and the largest villages having 150% of the average village population. Based on these assumptions, the study estimates that 4.5 million rural people lack road access (18% of the villages with 13% of the total rural population), while an additional 14 million people only have dry-season road access (43% of the villages with 38% of the rural population). As a result, approximately half the rural population (18.5 million people) faces physical isolation during at least part of the year. The other half of the rural population lives in the larger villages connected directly by MOC roads or by all-season rural roads (38% of the villages with 49% of the population).

19. This National Strategy for Rural Roads and Access aims to provide all villages with all-season access by constructing all-season roads to the 13,000 villages and the 4.5 million people currently estimated to lack road access, and by upgrading to an all-season standard the existing dry-season roads connecting an estimated 30,500 villages with 14 million people. It further aims to introduce

¹ This study has clearly demonstrated that villages are concentrated together much more than assumed in earlier access modelling carried out by the Asian Development Bank (*Myanmar Transport Sector Policy Note: Rural Roads and Access*, Asian Development Bank, 2016). As a result, fewer villages are estimated to be unconnected by road, while more villages are estimated to be connected by dry-season road.

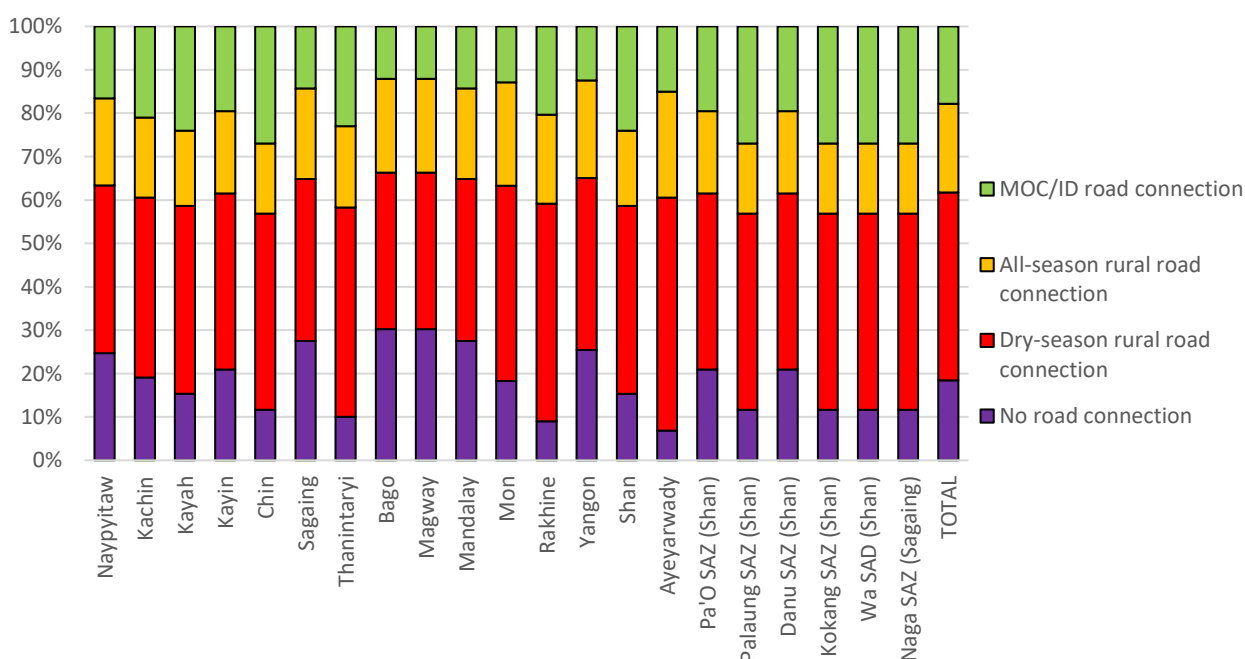
proper maintenance of the rural roads connecting the different villages, in order to sustain the connectivity that has been achieved.

Table 4 Estimated village access levels (#)

State/Region or SAD/SAZ	Total		No road connection		Dry-season rural road connection		All-season rural road connection		MOC/ID road connection	
	villages	million people	villages	million people	villages	million people	villages	million people	villages	million people
Naypyitaw	835	0.78	206	0.12	323	0.29	167	0.19	138	0.18
Kachin	3,136	1.08	598	0.12	1,300	0.40	578	0.24	660	0.32
Kayah	676	0.21	104	0.02	293	0.08	117	0.04	162	0.07
Kayin	2,079	1.23	435	0.16	843	0.45	394	0.28	406	0.34
Chin	1,504	0.38	175	0.02	680	0.14	243	0.07	406	0.14
Sagaing	6,153	4.18	1,690	0.73	2,300	1.50	1,281	1.09	881	0.85
Tanintharyi	1,250	1.07	125	0.06	603	0.43	234	0.24	288	0.34
Bago	6,628	3.80	2,006	0.75	2,390	1.35	1,431	1.04	801	0.66
Magway	4,852	3.33	1,469	0.66	1,749	1.18	1,047	0.91	587	0.58
Mandalay	5,038	4.02	1,384	0.70	1,883	1.44	1,049	1.05	722	0.82
Mon	1,297	1.48	237	0.16	584	0.61	309	0.44	167	0.27
Rakhine	4,185	2.65	375	0.13	2,099	1.12	859	0.65	852	0.75
Yangon	2,244	2.20	572	0.35	888	0.83	506	0.63	279	0.39
Shan	14,330	3.54	2,199	0.31	6,209	1.33	2,480	0.72	3,443	1.17
Ayeyarwady	12,682	5.31	866	0.19	6,817	2.39	3,093	1.59	1,907	1.14
Pa'O SAZ	1,214	0.30	254	0.04	492	0.11	230	0.07	237	0.08
Palaung SAZ	353	0.09	41	0.01	160	0.03	57	0.02	95	0.03
Danu SAZ	270	0.07	57	0.01	109	0.02	51	0.02	53	0.02
Kokang SAZ	267	0.07	31	0.00	121	0.03	43	0.01	72	0.02
Wa SAD	1,494	0.37	173	0.02	676	0.14	241	0.07	403	0.14
Naga SAZ	351	0.24	41	0.02	159	0.09	57	0.04	95	0.09
Total	70,838	36.39	13,037	4.58	30,677	13.97	14,469	9.41	12,654	8.42
	100%	100%	18%	13%	43%	38%	20%	26%	18%	23%

SAZ: Self-Administered Zone, SAD: Self-Administered Division

Figure 3 Estimated village access levels (%)



20. **Village access baseline.** The estimations presented above serve as an initial baseline for the National Strategy for Rural Roads and Access. However, this baseline will be replaced by actual data on access levels by December 2017. For each village, the population and access level will be verified, distinguishing between i) no road access, ii) dry-season rural road access, iii) all-season rural road access and iv) direct access to MOC trunk roads.

21. **Rural transport services.** Although this strategy is focused on rural transport infrastructure, particularly roads, the importance of rural transport services must also be noted. Many rural people do not own personal means of transport that they can use, and are dependent on public transport services. Without access to public transport services, many people are unable to reap the benefits of road access. These public transport services may vary from neighbors who can provide a basic transport service for passengers and/or goods using their motorcycle or other vehicle, to professional transport services that provide regular public transport along fixed routes. The latter generally require a license from the Road Transport Administration Department (RTAD) under the Ministry of Transport and Communications (MOTC). A recent ADB study² found that rural transport generally responds to demand, that transport fees are generally competitive and fair, and that the standard of rural transport services quickly improves once road access was provided.

5. Planning and prioritization

22. **Township level planning.** Investment plans for rural roads will be prepared at township level, and consolidated at state/regional and at national level. The main plan will be the investment plan up to 2030, identifying all the investment needs to achieve all-season road access for all villages in the township. This will be complemented by rolling 3-year investments plans to identify current investments in support of the 2030 investment plan. The plans will include new construction to link unconnected villages, upgrading of existing roads from dry-season to all-season standard, and maintenance of the rural road network.

23. **Core Rural Road Network (CRRN).** To ensure that available funding for rural roads and access is used efficiently and effectively in achieving the objective of this strategy, the concept of a core rural road network (CRRN) will be applied. The CRRN refers to the minimum rural road network in a township required to connect all villages to each other and to the township capital, either directly or through the MOC trunk road network. Through the CRRN, all villages will be able to gain access to village tracts and the township capital, and through them to the district capital, state/regional capitals and major cities of the country, thus providing them with access to all services and facilities that the country has to offer.

24. Villages directly connected by MOC trunk roads or other roads managed by entities such as the Irrigation Department or the Ministry of Energy, will be considered connected and will not be provided with a separate CRRN connection. All other villages will be connected by a single CRRN road. Villages will only be permitted more than one CRRN road connection if the additional roads serve to connect more remote villages. Locations with important economic or cultural importance may also be connected by the CRRN (e.g. temples, touristic places, important agricultural areas, etc.), taking into account the limitation of single road access. Where a village is connected only by one rural road, that road will be selected as part of the CRRN. Where a village is connected by more than one rural road, the best road will be selected to form part of the CRRN, taking account of the length, surface type, condition and traffic volumes in the different roads. Where a village is not connected by any road, a tentative alignment will be identified, which will be selected as part of the CRRN for new construction. The CRRN will consist of the existing single road access for each connected village, as well as the tentative alignments for new construction linking unconnected villages.

² Myanmar Transport Sector Policy Note: Rural Roads and Access, Asian Development Bank, 2016.

Figure 4 Core Rural Road Network (CRRN)

The Core Rural Road Network (CRRN) is the minimum rural road network in a township required to connect all villages to each other and to the township capital, either directly or through the MOC trunk road network

- If a village is connected directly by an MOC trunk road, it does not require a CRRN road
- If a village is connected by only one rural road, that road forms part of the CRRN
- If a village is connected by more than one road, the best road is selected to form part of the CRRN
- If a village is not connected by a road, a tentative alignment is selected to form part of the CRRN for new construction.

25. The CRRN has yet to be identified for most townships in Myanmar. The pilot study covering 14 townships in the districts of Hinthada, Myingyan and Langkho, included the identification of the core rural road networks for these townships. Townships in Hinthada district (delta zone) were found to require an average of 0.6 miles of CRRN road per village, while in Myingyan district (dry zone) this increased to 1.2 miles of CRRN road per village due to lower number of villages and the larger distances between them. In Langkhe district (hill zone) this increased further to 2.0 miles of CRRN road per village due to the greater distance between villages and the steep topography, prohibiting direct connections. These averages have been used to estimate the CRRN sizes for the different states and regions in Myanmar depending on the geographic zones represented in each of them³.

26. The study estimates that a core rural road network of approximately 100,000 miles is required to connect all villages in Myanmar (in addition to the MOC roads that directly connect a portion of the villages and connect the CRRN roads with each other). For simplicity, the study assumes that the existing all-season rural roads all form part of the CRRN, and that the existing dry-season rural roads form part of the CRRN in as far as the total existing rural road network does not exceed the estimated CRRN length in each state/region⁴. The study estimates that nearly 50,000 miles of existing rural roads form part of the CRRN, including the 15,000 miles of existing all-season rural roads and 35,000 miles of existing dry-season rural roads that require upgrading to all-season access. The construction of an additional 50,000 miles of new CRRN roads is estimated to be required to complete the CRRN and link the 13,000 villages that currently lack road access.

Table 5 Estimated CRRN lengths (miles)

State/Region or SAD/SAZ	CRRN/village miles	CRRN length miles	All-season standard		Dry-season standard		For new construction	
			miles	%	miles	%	miles	%
Naypyitaw	1.46	1,223	490	40%	733	60%	-	0%
Kachin	1.70	5,326	516	10%	1,512	28%	3,298	62%
Kayah	1.85	1,253	154	12%	220	18%	879	70%
Kayin	1.62	3,369	608	18%	532	16%	2,229	66%
Chin	3.00	4,512	82	2%	4,431	98%	-	0%
Sagaing	1.35	8,294	1,694	20%	4,441	54%	2,159	26%
Tanintharyi	1.58	1,976	611	31%	1,365	69%	-	0%
Bago	1.23	8,160	1,776	22%	2,438	30%	3,946	48%
Magway	1.23	5,974	1,484	25%	4,281	72%	209	3%
Mandalay	1.35	6,791	2,176	32%	2,460	36%	2,155	32%
Mon	0.91	1,174	451	38%	388	33%	335	29%

³ For Chin State and average of 3.0 miles of CRRN road per village was used due to the very steep terrain in this state.

⁴ In reality it is likely that a portion of the existing all-season rural roads and a significant portion of the existing dry-season rural roads do not form part of the CRRN as many villages are connected by more than one rural road, only one of which would be selected as CRRN road.

State/Region or SAD/SAZ	CRRN/village miles	CRRN length miles	All-season standard		Dry-season standard		For new construction	
			miles	%	miles	%	miles	%
Rakhine	1.29	5,419	618	11%	1,011	19%	3,790	70%
Yangon	1.10	2,470	640	26%	931	38%	899	36%
Shan	1.85	26,567	1,551	6%	5,222	20%	19,794	75%
Ayeyarwady	0.72	9,167	1,055	12%	2,353	26%	5,759	63%
Pa'O SAZ	1.62	1,967	296	15%	828	42%	843	43%
Palaung SAZ	2.01	709	176	25%	279	39%	254	36%
Danu SAZ	1.62	438	141	32%	296	68%	-	0%
Kokang SAZ	2.01	537	124	23%	145	27%	269	50%
Wa SAD	2.01	3,002	44	1%	100	3%	2,858	95%
Naga SAZ	2.01	705	18	3%	687	97%	-	0%
Total		99,034	14,703	15%	34,654	35%	49,677	50%

SAZ: Self-Administered Zone, SAD: Self-Administered Division

27. **Prioritization of CRRN roads.** Under this National Strategy for Rural Roads and Access, government investments in rural roads will be exclusively targeted towards CRRN roads with the aim of achieving the strategy objective of connecting all villages by all-season road at the lowest cost and within the shortest timeframe. For this purpose, the CRRN will be identified for every township by 31 December 2017, allowing investments to be exclusively targeted towards CRRN roads from financial year 2018-2019 onwards. The identified CRRN list will form the basis for any rural road investments, including those financed by development partners. Rural roads that have not been identified as being part of the CRRN, cannot receive government funding.

28. **Investment categories.** The required investments in the CRRN include three investment categories: i) the maintenance of existing all-season and dry-season CRRN roads, ii) the construction of new dry-season CRRN roads linking to unconnected villages, and iii) the upgrading of existing dry-season CRRN roads to all-season standard. In the preparation of the investment plans, first priority will be given to maintenance of existing roads in order to avoid accelerated deterioration of these roads and to sustain the achieved access levels. This will be followed by construction of new dry-season CRRN roads linking unconnected villages as a second priority for investment, but only where the required land acquisition has been completed by local government. In light of the difficulties and costs related to land acquisition for new construction, it is expected that investments in new construction works (excluding the land acquisition costs that will be financed by local governments or local communities) will not exceed 20% of annual investments in rural roads. Remaining funds will be allocated to the upgrading of existing dry-season CRRN roads to an all-season standard.

Figure 5 Prioritization of rural road investment categories



29. **Ranking of roads.** Within each investment category, the required investments will span a large number of years. In order to determine which CRRN roads will receive priority in the allocation of funding, the CRRN roads will need to be ranked. The CRRN road ranking will be carried out on the basis of the size of the villages to be connected, with priority given to roads connecting villages with larger populations. In the ranking, use will be made of official population census data for the different villages. The CRRN ranking will be carried out at township level, for all CRRN roads in the township.

30. Although the ranking will be based on the population size of the villages connected by the different roads, account will be taken of the cost per beneficiary (total estimated cost of the road works divided by the total population of the villages connected by the road). Where this cost per beneficiary is very high, alternative standards or access solutions may be required to reduce the cost. Where this is not possible, the road may be given a lower ranking in favor of other roads with lower costs per beneficiary (for which the available budget may benefit a larger number of people).

6. Maintenance and sustainability

31. In order to ensure the sustainability of the core rural road network, proper maintenance will be required. This will include annual routine maintenance aimed at avoiding damage, complemented by periodic maintenance every few years to renew the road surface and carry out spot repairs.

32. **Routine maintenance.** Routine maintenance includes the cleaning and clearing of the different road elements to ensure they function properly, as well as small repairs to the road surface and structures to avoid larger damage from occurring. Particular attention will be given to clearing the drainage system and avoiding erosion, clearing any landslides or other obstacles on the road, and repairing small damages to the road surface and any structures that could lead to more significant damages. Routine maintenance works will be contracted out to community groups formed and trained to carry out these maintenance activities. In the case of sealed roads or damages to concrete or steel structures, the routine maintenance will be contracted out to private sector contractors. In order to reduce management costs and the need for frequent inspections, contracts will generally be paid on a performance basis, against the resulting condition of the road and its compliance with predefined performance standards.

33. **Periodic maintenance.** Periodic maintenance is carried out every few years to renew the road, especially the road surface. This may include regravelling, spot repairs of macadam or concrete roads, bituminous seals or overlays. This will be complemented by spot repairs where necessary. Periodic maintenance works will be contracted out to private sector contractors with the required experience and equipment. Contracts will be paid on a volume basis, against the volume of work completed.

34. **Maintenance planning and prioritization.** All roads will receive routine maintenance, and performance-based contracts will be awarded to community groups or maintenance contractors each year for all CRRN roads (except where works are planned). In order to determine the additional maintenance needs, a rapid condition assessment will be carried out at the end of the rainy season to define which roads will receive periodic maintenance and if any roads require emergency maintenance aimed at opening up the road and making it passable. Where available funding is insufficient to cover all maintenance needs, emergency maintenance will receive priority, followed by routine maintenance and periodic maintenance. Road maintenance works will be ranked according to the population size of the villages connected by each road.

35. **Maintenance funding.** Maintenance of existing CRRN roads will receive priority over the upgrading of CRRN roads to an all-season standard or the construction of new CRRN roads. For this purpose, 15% of the available rural road funding will be reserved for maintenance. Only if there is maintenance funding remaining after all maintenance needs have been addressed, may this funding be allocated to upgrading or new construction.

7. Financing and budget allocation

36. **Estimated road construction and upgrading costs.** Based on the DRD standard rates for rural road works for 2016-2017, the total costs of new construction and upgrading of the core rural road network to connect all villages by all-season roads is estimated to be approximately MMK 8,000 billion. This includes MMK 2,800 billion for upgrading the existing dry-season CRRN roads to all-season standard⁵, just over MMK 1,000 billion for new construction of missing CRRN roads to earthen standard⁶, and MMK 4,100 billion for upgrading these new roads to an all-season standard. It must be noted that the upgrading costs are based on unsealed macadam standard, and do not take account of possible other surface types. This cost also does not yet include the costs of bridges.

Table 6 Estimated CRRN requirements

State/Region or SAD/SAZ	Total CRRN miles	Existing dry-season CRRN roads miles	Upgrading existing CRRN roads to all-season standard		Missing CRRN roads miles	Constructing new CRRN roads to dry-season standard		Upgrading new roads to all-season standard MMK million
			MMK million/mile	MMK million		MMK million/mile	MMK million	
Naypyitaw	1,223	733	68.5	50,264	-	21.3	-	-
Kachin	5,326	1,512	95.1	143,800	3,298	25.3	83,335	313,685
Kayah	1,253	220	89.4	19,624	879	21.2	18,636	78,599
Kayin	3,369	532	66.6	35,440	2,229	15.6	34,681	148,419
Chin	4,512	4,431	94.8	420,070	-	21.2	-	-
Sagaing	8,294	4,441	63.0	279,904	2,159	16.4	35,468	136,060
Tanintharyi	1,976	1,365	85.6	116,784	-	22.4	-	-
Bago	8,160	2,438	91.9	224,049	3,946	20.6	81,212	362,670
Magway	5,974	4,281	62.4	267,030	209	17.3	3,615	13,011
Mandalay	6,791	2,460	61.5	151,298	2,155	17.7	38,203	132,535
Mon	1,174	388	89.0	34,556	335	18.0	6,038	29,846
Rakhine	5,419	1,011	88.3	89,252	3,790	23.2	87,737	334,682
Yangon	2,470	931	140.9	131,248	899	17.3	15,529	126,742
Shan	26,567	5,222	77.2	403,276	19,794	20.3	402,147	1,528,543
Ayeyarwady	9,167	2,353	108.2	254,573	5,759	19.3	111,255	623,108
Pa'O SAZ	1,967	828	77.1	63,840	843	22.5	18,938	65,001
Palaung SAZ	709	279	72.8	20,326	254	19.3	4,900	18,527
Danu SAZ	438	296	77.1	22,849	-	22.5	-	-
Kokang SAZ	537	145	72.3	10,442	269	21.1	5,678	19,408
Wa SAD	3,002	100	65.1	6,523	2,858	18.8	53,625	186,000
Naga SAZ	705	687	77.1	52,994	-	16.9	-	-
Total	99,034	34,654	82.1	2,798,142	49,677	19.9	1,000,995	4,116,837

SAZ: Self-Administered Zone, SAD: Self-Administered Division

37. **Estimated road maintenance costs.** The existing all-season CRRN roads will require periodic maintenance every 5 years or so. With an average periodic maintenance cost of MMK 12 million/mile every 5 years, the average annual cost for periodic maintenance of all-season CRRN roads will start at MMK 35 billion and gradually increase to approximately MMK 250 billion as the entire CRRN is constructed and upgraded to an all-season standard. The total costs of periodic maintenance for the 15-year period is just over MMK 2,000 billion. In addition, the routine and emergency maintenance of all existing CRRN roads (all-season and dry-season standard) at an average annual cost of MMK 500,000/mile will require an investment of MMK 550 billion over the 15-year period, growing from MMK 22.5 billion per year initially to MMK 50 billion per year as the remaining CRRN roads are constructed. Total maintenance costs over the 15-year strategy period

⁵ Based on the average standard rate for macadam roads.

⁶ This does not include the costs of land acquisition.

are estimated to be in the order of MMK 2,500 billion, reaching MMK 300 billion per year once the entire CRRN has been constructed and upgraded to all-season standard.

38. **Current sources and amounts of funding.** The main source of funding for rural roads is currently the Union Budget, with allocations made through both MOALI (DRD) and MOBA. The budget allocations over the past few years have averaged approximately MMK 200 billion per year for both Ministries together. Assuming a similar allocation for the 15 years covered by this strategy, this would amount to MMK 3,000 billion, or less than a third of the requirement.

39. Development partners are also increasingly providing funding for rural roads and bridges. Based on current and planned development partner funding, contributions for the 15 years covered by this strategy are estimated to be in the order of MMK 600-900 billion.

40. State and Regional governments are increasingly investing in roads. Up till now these investments have been in trunk roads managed by MOC, but it is expected that the states/regions will start investing in rural roads as well. This is likely to average MMK 50 billion per year, or MMK 750 billion over the 15-year period covered by this strategy.

Source	Funding up to 2030 (MMK million)
Union Budget	3,000,000
State/Regional Budgets	750,000
Development Partners	750,000
Total estimated funding	4,500,000
Total estimated needs	10,500,000

41. **Rural road fund.** To cover the gap in funding and ensure that the objectives of this strategy are achieved by 2030, a rural road fund will be created with financing from a fuel tax. The fuel tax will be in the order of MMK 75-100 per liter of fuel, generating in the order of MMK 4,000-5,000 billion over the 15-year period. Such a fuel tax, together with the planned funding from Union Budget, state/regional budgets and development partners, will allow all estimated costs for rural road development and maintenance to be covered, allowing all villages to be connected by all-season roads by 2030.

42. **Budget allocation to states and regions.** The available funding from the Union Budget will be shared amongst the different states and regions on the basis of the population of each state/region. Additional funding may be allocated to very poor states/regions or to states/regions suffering from very low rural access levels in terms of the percentage of villages or percentage of the rural population that has been connected by (all-season) road. Funding from state/regional governments will be exclusively allocated within the state/region concerned. Development partner funding will be for specific states/regions in line with the project documents, and will serve to complement government funding in those states/regions where access levels are very low (in terms of the percentage of the villages or rural population that has been connected by an all-season road).

43. **Budget allocation to townships.** At state/regional level, the available funding will be allocated to the different townships on the basis of their population. Account will also be taken of the access levels in each township, providing additional funding to townships where a high percentage of the rural population lives in villages that are not connected by all-season road. The allocation of the rural road funding to the different townships will be decided and approved by the Road & Bridge Supervision Committee in each state/region (see also section 9).

44. **Budget allocation to roads.** Within each township, the budget allocation to the different roads will follow the investment plans and the prioritization and ranking criteria presented in this strategy. In principle, the available budget for the rural road sector in each township will be allocated first to the maintenance of existing CRRN roads, subsequently to the construction of new CRRN roads (only where land acquisition has been ensured beforehand), and lastly to the upgrading of

existing dry-season CRRN roads to an all-season standard. Within each of these three investment categories, the budget will be allocated in the order of the population size of the villages linked by each road.

8. Indicators and targets

45. To monitor the progress in achieving the development objective of the National Strategy for Rural Roads and Access, use will be made of the following indicators and targets. The baseline values are currently calculated on the basis of the values estimated using data from the 14 pilot townships. The baseline will be updated using actual data that will be collected for all 330 townships by December 2017. These indicators will subsequently be calculated on an annual basis in December each year using data collected at township level. The calculated indicators will be reported to the different Road and Bridge Subcommittees as well as the national and the state/regional parliaments by the end of each financial year.

Table 7 Key performance indicators for rural roads and access

Indicator	Source of data	Baseline 2016*	Target 2030
Percentage of rural population in villages connected by road	DRD, MOBA	87%	100%
Percentage of rural population in villages connected by all-season rural road or MOC road	DRD, MOBA	49%	100%
Percentage of villages connected by road	DRD, MOBA	82%	100%
Percentage of villages connected by all-season rural road or MOC road	DRD, MOBA	38%	100%
Percentage of villages served by public transport services	DRD, MOBA, RTAD	N/A	90%
Percentage of the Core Rural Road Network that has been completed to at least dry-season standard	DRD, MOBA	46%	100%
Percentage of the Core Rural Road Network with an all-season standard	DRD, MOBA	15%	100%
Length of rural roads constructed	DRD, MOBA	0 miles	50,000 miles
Length of rural roads upgraded	DRD, MOBA	0 miles	80,000 miles

* This data is based on estimations. Actual data will be collected for all townships by December 2017 and updated annually.

9. Institutional responsibilities

46. There are several institutions involved in the rural road sector. The most important of these are the Department of Rural Development (DRD) under the Ministry of Agriculture, Livestock and Irrigation (MOALI), the Ministry of Border Affairs (MOBA), the Department of Highways (DOH) and Department of Bridges (DOB) under the Ministry of Construction (DOH), and the Road Transport Administration Department (RTAD) under the Ministry of Transport and Communications (MOTC). To improve the coordination between these different ministries and their departments, a Road and Bridge Committee was created in 2016, consisting of the following three subcommittees: a Policy Subcommittee, an Implementation Subcommittee and a Supervision Subcommittee (one in each state/region). These subcommittees will together be responsible for implementing this National Strategy for Rural Roads and Access.

47. **Policy Subcommittee.** The Policy Subcommittee is chaired by the ministers from the different 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. It will also be responsible for approving the investment plans, introducing the Rural Road Fund and issuing the Rural Road Standards and Specifications.

48. **Implementation Subcommittee.** The Implementation Subcommittee is chaired by the permanent secretaries for MOC and MOTC and includes the director generals for DRD, RTAD, DOH and MOBA. It is responsible for preparing rural road standards, for quality control of rural road works, for land acquisition, and for preparing progress reports regarding the rural road sector indicators.

49. **Supervision Subcommittee.** Supervision Subcommittees 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 approving the state/regional investment plan for rural roads and allocating the funding to the different townships within each state/region.

50. **Plan preparation and approval.** With support from village tract leaders, the township staff of DRD and MOBA will prepare investment plans identifying the new construction, upgrading and maintenance works to be carried out each year, and the required funding. The plans will be submitted to the state/regional governments and the Supervision Subcommittees for approval, and to the central government ministries and Implementation Subcommittee for information.

51. **Financing.** DRD and MOBA will transfer the available Union Budget financing to the different states/regions, where it will be complemented by state/regional budget allocations and in some cases by development partner funding. The state/regional government will allocate the available rural road sector budgets to the different townships. At township level, the available rural road sector funding will be allocated in accordance with the investment plans and the prioritization and road ranking criteria set out in this strategy.

52. **Procurement.** The implementation of all rural road works will be outsourced to private sector contractors or community groups. Rural road works will not be carried out through force account. Procurement will be carried out in line with *The Directive on Execution of Works by Contract (2014)* or any national procurement legislation that may replace it.

53. **Supervision and quality control.** A three-tier system of supervision and quality control will be introduced. The township staff of DRD and MOBA will carry out weekly inspection visits to check the quality and overall performance of the works (for routine maintenance, inspection visits will be less frequent). This will be complemented by independent third-party quality control consultants that will visit each rural road project at least once during the implementation of the project. These consultants will be hired by the state/regional offices of DRD and MOBA. Results of this state/regional quality control will be presented to the Supervision Subcommittee on a three-monthly basis. Lastly, the national offices of DRD and MOBA will carry out a random sampling of rural road projects and carry out a quality control in at least 1% of all rural road projects. Results of this central quality control will be presented to the Implementation Subcommittee on a six-monthly basis.

54. **Monitoring.** Data on the length of roads constructed, upgraded and maintained will be collected by township staff of DRD and MOBA and presented to the Supervision Subcommittee on a three-monthly basis. Data related to the percentage of villages and the percentage of the rural population connected by (all-season) road will be collected by township and state/region staff of DRD and MOBA and presented to the Supervision Subcommittee and the Implementation Subcommittee on a six-monthly basis. On an annual basis, in December of each year, the key performance indicators for each township and state/region will be calculated and presented to the Policy Subcommittee. The key performance indicators will assist in determining budget allocations to the rural road sector and to the different states and regions for the subsequent financial year.

55. **Rural transport services.** It is expected that the private sector will respond to improved road access by providing improved public transport services to address demand. However, this will need to be monitored in order to ensure that public transport services are appropriate in the type and quality of service they provide and the cost of this service. Where necessary, additional effort may

be needed to improve the quality and cost of the service. RTAD will be responsible for monitoring the quality and costs of rural transport services, with support from DRD and MOBA. Information on rural transport services will reported to the Implementation Subcommittee on an annual basis.

56. **National Rural Road Agency.** Within the next 10 years, an autonomous National Rural Road Agency (NRRRA) will be created that will become responsible for managing the rural road sector and for preparing and implementing the rural road investment plans. The NRRRA will prepare investment plans according to this strategy and other government policies. The investment plans will subsequently be approved by the Supervision Subcommittee. The NRRRA will be responsible for overall management of the implementation of the approved investment plans, and for reporting progress to the Supervision Subcommittee and the Implementation Subcommittee. Financing will be provided from the Rural Road Fund, complemented by Union Budget allocations and development partner funding. At state/regional level, the implementation management for the approved works will be appointed to an organization with proven experience, presence and capacity in the different townships (multiple organizations may be appointed, but each township will be under the responsibility of a single organization). All works implementation will be outsourced to the private sector or community groups, with contracts managed and supervised by the appointed organizations.