



MYANMAR TRANSPORT
SECTOR POLICY NOTE
ROAD SAFETY

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Foreword

Myanmar is at a historic milestone in its transition into a market economy and democracy. After decades of isolation and stagnation, the country has, since 2011, been undergoing a fundamental political, economic, and social transformation at unprecedented speed and scope. Achieving the country's high growth potential will require continued reforms and structural transformation, especially in advancing major investments in infrastructure, developing relevant capacities and skills, and enhancing the business environment. This will enable Myanmar to reach the ranks of upper middle income economies by 2030.

Due to massive underinvestment and neglect in recent history, Myanmar's infrastructure lags behind its Association of Southeast Asian Nations neighbors, and hinders access to markets and social services. High transport costs and associated limited access to markets and services are among the main causes of poverty and regional inequality. Twenty million people still live in villages without access to all-season roads. The questions then are: how can basic transport services be provided to all? What does it take to improve the quality of the transport infrastructure and services for the private sector? How can Myanmar reduce the economic and social costs of transport?

The Government of the Republic of the Union of Myanmar is committed to addressing these questions, and the underlying issues. Toward this end, the government has commissioned from the Asian Development Bank (ADB) the preparation of a *Transport Sector Policy Note*. The Transport Sector Policy Note takes stock of the transport sector challenges, provides a strategic framework for reforms that could assist Myanmar's policymaking, and identifies the areas where international financial and technical assistance could make the highest contribution to the development of Myanmar's transport sector.

The *Transport Sector Policy Note* is composed of nine reports, including this one, and a summary for decision-makers. The first two—*How to Reform Transport Institutions*, and *How to Reduce Transport Costs*—provide an overview and framework for policy reform, institutional restructuring, and investments. These are accompanied by separate reviews of key subsectors of transport: *Railways*, *River Transport*, *Rural Roads and Access*, *Trunk Roads*, and *Urban Transport*. These reports summarize and interpret trends on each transport sector to propose new initiatives to develop them. The thematic report *Road Safety* builds a first assessment of road safety in Myanmar. The thematic report *How to Improve Road User Charges* is a stand-alone study of cost-recovery in the road sector.

The research was organized by ADB and the then Ministry of Transport, with the active participation of the Ministry of Construction and the then Ministry of Railway Transportation. A working group comprising senior staff from these government ministries guided preparation. The work stretched over the period of 24 months, and was timed such that the final results could be presented to the new government that assumed office in April 2016, as a contribution to its policy making in the transport sector.

As the *Transport Sector Policy Note* demonstrates, Myanmar can, and should, develop a modern transport system that provides low-cost and safe services, is accessible to all including in rural areas and lagging regions, and connects Myanmar with its neighbors by 2030. The government has the determination to doing so, and can tap the support from development partners, the private sector and other stakeholders. It can take inspiration from good practices in the region and globally.

The *Transport Sector Policy Note* provides a rich set of sector data, is meant to be thought-provoking, presents strategic directions, and makes concrete reform recommendations. It stresses the need to strengthen the role of planning and policy-making to make the best use of scarce resources in the transport sector. It highlights the need to reexamine the roles of the state—and particularly state enterprises—and the private sector in terms of regulation, management, and delivery of services in the sector. It identifies private sector investment, based on principles of cost-recovery and competitive bidding, as a driver for accelerated change. Finally, it aims at a safe, accessible, and environmentally friendly transport system, in which all modes of transport play the role for which they are the most suited.

We are confident that the *Transport Sector Policy Note* will provide value and a meaningful contribution to Myanmar’s policymakers and other key stakeholders in the transport sector.



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Acknowledgments

The Transport Sector Policy Note was prepared at the initiative of Hideaki Iwasaki, director of the Transport and Communications Division of the Southeast Asia Department of the Asian Development Bank (ADB). It was prepared by ADB staff and consultants. Adrien Véron-Okamoto (ADB) coordinated the study, prepared the notes *How to Reduce Transport Costs*, *How to Improve Road User Charges* and the overall *Summary for Decision-Makers*, drafted the executive summaries, and contributed substantially to the notes *How to Reform Transport Institutions*, *River Transport*, *Trunk Roads*, and *Urban Transport*. Gregory Wood prepared the note *How to Reform Transport Institutions*. The *Railways* note was prepared by Paul Power. It also benefited from analytical research and suggestions by Richard Bullock. Eric Howard prepared the Road Safety note. Kek Chung Choo prepared the *River Transport* note. Paul Starkey and Serge Cartier van Dissel prepared the *Rural Roads and Access* note. Serge Cartier van Dissel also prepared the *Trunk Roads* note. Colin Brader (of Integrated Transport Planning) prepared the *Urban Transport* note.

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Assistance from the Government of Myanmar, especially of the Ministry of Transport and Communications, the Ministry of Construction, and the Ministry of Agriculture, Livestock and Irrigation, is gratefully acknowledged. A first draft of these notes was presented and reviewed by government's study counterparts in 2015. This final version benefited from the comments and suggestions received.

Abbreviations

ADB	Asian Development Bank
DOH	Department of Highways
iRAP	International Road Assessment Program
km	kilometer
km/h	kilometer per hour
MOTC	Ministry of Transport and Communications
MRSAP	Myanmar Road Safety Action Plan
NGO	nongovernment organization
NRSAP	National Road Safety Action Plan
NRSC	National Road Safety Council
RTAD	Road Transport Administration Department
TRESC	Traffic Rules Enforcement Supervisory Committee
UN	United Nations

Executive Summary

Overview

The rapid economic and democratic transition underway in Myanmar since 2012 brings with it opportunities for development and poverty reduction. It may also come with negative impacts, such as a rapid deterioration of road safety and a resulting unprecedented increase in road accidents.

This note presents a first road safety assessment and management capacity review of this type in Myanmar. The study was carried out by for the Asian Development Bank (ADB), in cooperation with the Road Transport Administration Department (RTAD), the Ministry of Transport and Communications (MOTC), and other key government agencies involved in road safety management. At the outset of the study, there was a clear lack of external knowledge of the situation regarding road safety in Myanmar, as well as a limited understanding within the country of how the situation compared with that of other countries. The objective of the study was to propose recommendations for priority interventions and actions that ADB or other donors could later support, provide a broad review of the safety situation, and perform a diagnostic analysis of management capacity.

Road Safety Situation

Myanmar is at a critical point in terms of road safety. In 2014, road-related deaths reached 4,300, which is twice as many as that recorded in 2009. One-third of all injuries reported by hospitals are from traffic accidents. The absolute level of fatalities is not yet as high as in other Southeast Asian countries, but this is mainly because Myanmar's motorization rates are low.

Fatalities are expected to double by 2020 and reach 15,000 per year by 2025 if the situation continues unchecked. Clearly, urgent action is required.

The annual cost of road accidents to Myanmar's economy is estimated at \$800 million for 2013, or some 1.5% of gross domestic product (GDP). Current road crash levels are a major hindrance to the country's economic activity. Expenditure on preventative road safety management needs to be considered not as a cost, but as an investment in the country's economic development.

Pressures that will result in increased road traumas are continuing to build. Strong, well-managed and well-funded road safety efforts can limit the frequency of road accidents and deaths. Reducing fatality levels, however, will require significant effort and overwhelming political commitment between 2016 and 2020. While the risk of fatal crashes continues to rise, there will be an unavoidable "ramping-up" period, as the Myanmar authorities prepare themselves to cope with the problem.

Motorcyclist and pedestrian deaths compose the majority of annual fatalities, a common situation across Southeast Asian nations. Action to reduce fatal crash risks for these two groups (and three-wheelers) should be of the highest priority.

Achievements and Shortcomings

For many years, road safety did not receive due attention. There is a lack of clarity and accountability regarding the responsibilities and issues concerning the government departments involved in road safety in Myanmar. Agencies also acknowledge the existing weaknesses in road safety management, including poor data systems, weaknesses in legislation, insufficient funding, a need for measurable road safety targets (particularly concerning behavior risk), and a lack of effective and scalable implementation to address risky behaviors.

Myanmar has now had on paper (since 2014) a robust institutional structure for road safety management. It exists in the form of the Myanmar Road Safety Action Plan (MRSAP) 2014–2020, piloted at a high level by the National Road Safety Council (NRSC), and coordinated on the ground by the Traffic Rules Enforcement Supervisory Committees (TRES-Cs), which operate at the regional/state level.¹

There is a risk, however, that these arrangements could remain formal and not put into practice. An indicator of the challenges the country faces in responding to increasing risk in its road network was summarized by the Department of Highways (DOH; it was “Public Works” until April 2015), which admitted that it did not have any specific road safety guidelines that could be applied to its road designs. This is indicative of the substantial knowledge-development task ahead, which will require substantial energy, management, and investment.

The traditional approach in use has focused almost solely on road users and their behaviors as the only issue affecting road safety. The safe system approach—in which the outputs of the suppliers of roads and vehicles, setters of speed limits, providers of emergency medical care, and the land use planners who influence traffic flows entering roads from adjacent properties are all factors that affect the crash risk on a given road—is not yet fully understood in Myanmar. These stakeholders are not yet recognized as major contributors to the level of risk experienced in the network. The “blame the user” approach was common in many high-income countries until 2000 or 2005. It is now the main road-safety story line observed in Myanmar. The fact that illegal road-user behavior accounts for less than 50% of fatal crashes compared with other factors, including those listed above, is not yet fully understood.

While there is a strong interest in road safety and a readiness to adopt measures to improve outcomes, road safety management remains fragmented. There is not yet any coordinated overall mechanism in which all agencies can participate in a strategic sense. The new National Road Safety Council was established in mid-2014, but it is a high-level formal body with some 25 members. It needs to have executive and working groups, and to receive advice from those who carry out the day-to-day road safety tasks and who can offer policy and legislative recommendations. The skills for providing that advice do not yet exist—with some exceptions—in Myanmar. However, such skills have to be promoted, and the staff developed, as an urgent priority. At the regional/state level, some officers and political figures have displayed a genuine interest in improving the current situation.

¹ Myanmar is divided into seven states, seven regions, and the union territory (which is the capital, Naypyidaw). The regions and states are equivalent in terms of the level of government, but the states have predominantly minority populations.

There is a need to develop a more strategic focus, based on data, research evidence, and successful practice elsewhere. This is necessary to better position Myanmar to manage its growing road-safety challenges and implement the higher-priority elements of the MRSAP (and other emerging priority actions). The TRES Cs have played an important part, especially at the operational level, by trying to respond to emerging issues at crash locations. This input must not be lost, but the role of the TRES Cs should be reconsidered in order to preserve the value that they have delivered.

Rising to the Challenge

Building Road Safety Management Capacity

Road Safety Management is the first pillar of the UN Decade of Action for Road Safety Plan because the quality of the management systems directly connects to the quality of the interventions and the results that are achieved.

Building road safety management capacity in Myanmar to address road safety goals requires a systemic response, careful leadership, and sustained long-term investment. It is a very substantial task, requiring commitment, assistance, and substantial funding for resourcing during the start-up phase for at least 5 years. Sustained effort requires adequate and dedicated staff resources.

The proposed management arrangements are for the establishment of an executive group at the director general level nationally, supported by a working group of director-level managers. Technical working groups will provide input to this working group on all issues that would benefit from the involvement of more than one department. The executive group would report annually to the NRSC.

The RTAD, as the lead government agency, would provide management and administrative support for these two groups. Consultative arrangements would be established with other stakeholders—truck and bus operators, nongovernment organizations (NGOs), and auto clubs, among others—and with regional/state and local governments. This model would be applied initially in Yangon and Mandalay regions.

A “Safer Roads” Program

A dedicated program of targeted road safety improvements (“Safer Roads” program) would be able to address the most severe safety risks. These could be identified through an International Road Assessment Program (iRAP) crash risk assessment or through an improved road-crash database. The program could initially target: (i) blackspot treatments, (ii) the installation of safety features on dangerous corridors, (iii) junction improvements, and (iv) the treatment of built-up areas at highway crossings. This program would need dedicated funding (i.e., a budget line), clear operating procedures, and a central management team. The program would initially be run by the DOH, in partnership with the RTAD. The program should be established as a long-term government program, as it could be financed by international financing institutions and donors.

Implementing Demonstration Projects

It is proposed that demonstration projects be used to support the development of these road safety management arrangements, nationally and in Yangon and Mandalay regions.

Nationally, the treatment of a rural road corridor is proposed, with measures to improve: infrastructure safety, including speed limit reviews; traffic safety enforcement and social marketing; school and village programs; post-crash emergency care; the monitoring of the condition of trucks and buses and of driver behaviors; and the monitoring and evaluation of implementation and outcomes.

Key enabling measures that are critical for road-safety progress across the country would be part of the projects. These include an upgraded crash data system that could provide, for example, sufficient information for the detailed planning of appropriate measures for higher-risk locations, a national road network crash-risk assessment, a linkage of court records to license records to support a demerit point system, and the introduction of a road-safety auditing process of road works.

Policy reviews would also need to be carried out, and change implemented, as a third component of the demonstration project at the national level. These would include a review of licensing policies, vehicle standards, heavy vehicle safety management, crash investigation training for police, and a complete review of DOH road design manuals to include modern road safety based on those designs.

For Mandalay Region, the demonstration project would be a program to reduce fatal and serious crash risk for motorcyclists in defined parts of the urban areas of Mandalay region, including the separation of motorcyclists from other vehicle lanes, helmet-wearing enforcement, and lowered speed limits in higher-risk locations.

For Yangon Region, the demonstration project would be a program to reduce serious and fatal crash risk for pedestrians crossing or walking along selected outer urban arterial roads.

A final component of the demonstration projects in all locations will be a focused, funded effort to build knowledge for practitioners, senior executives, and ministers. The scale of the challenge here is very substantial, but this action is critical.

These demonstration project components would all rely on adequate funding for technical assistance, staff resources, and the goods and services necessary for the interventions.

Overall, this would be a major program, and the challenges associated with its successful implementation (including project management) should not be underestimated. The implementation process of demonstration-project activities will drive management capacity development.

Priority Measures for Improved Road Safety Performance

In parallel, a necessary task for the executive group and working groups will be the implementation of the MRSAP. Given that there is a total of 101 action items, priority action items should be identified and detailed planning applied to assist meaningful implementation.

Immediate (short-term) impacts could be expected from

- substantially increased police enforcement of
 - helmet wearing,
 - correct behavior of drivers and riders at pedestrian crossings,
 - speed limits,
 - seat belt wearing, and
 - the licensing of drivers and riders;
- substantially increased penalties for offences;
- extensive public advertising campaigns supporting police enforcement efforts;
- reviews of speed limits on unsafe lengths of road, and reviews of speed limits where motorcyclists operate with other traffic;
- the installation of crash barriers on approaches to bridges, as well as railings and/or parapets on bridges on higher-speed routes, to protect motorists from hitting bridge end posts—a type of crash that involves violent force;
- the introduction of extensive warning chevrons and signage on curves, with the advisory travel speed indicated on a plate below the diamond-shaped curve sign, also guideposts and reflectors along rural highways, good-practice line marking at intersections, and traffic lights at higher-speed high-crash-risk intersections;
- an upgrade of the safety standards of pedestrian crossings on the higher-speed roads with higher traffic and pedestrian volumes, based on the experience of the proposed Yangon demonstration project; and
- the installation of seat belts at the rear of all government vehicles, with the requirement that all government employees wear a safety belt if it exists.

Medium-term-positive impact could be expected from

- an implementation of the Sector 9 actions in the National Road Safety Action Plan (NRSAP), specifically the “enabling actions” regarding an accident database, research, and the annual costs of crashes in Myanmar;
- the learning and acceptance of safe-system thinking by the DOH and other government agencies, and the introduction of safe-system compliance checks and road safety audits of new road projects;
- a network road-crash-risk assessment implemented by the DOH (possibly using iRAP methods);
- a retrofitting of safety treatments for unsafe roads, especially the separation of motorcycle lanes from other traffic lanes, and their successful use as planned; and
- legislation requiring all new cars to have rear seat belts.

Enabling actions for the medium term that should commence as soon as possible, preferably immediately, include:

- a linkage of the offence data system to the licensing system, and the development of a demerit point system; and
- a review and upgrade of the emergency-response and trauma-management systems.

The management capacity development that is the focus of the demonstration projects will, in due course, support the meaningful implementation of selected actions from the Action Plan. But this will not be immediate. There will be a prolonged period of learning.

Conclusion and Recommendations

Success in countering the relentless rise in motorization and associated fatality and serious injury growth will rely on a substantial investment in having a robust management capacity in place. Without this capacity, implementation will not be effective.

Building road-safety-management capacity while developing knowledge across organizations and political levels will be very difficult and demanding task, and much will be asked of senior officers beyond the normal demands of government. Changing organization and community cultures while building their knowledge and, at the same time, having to implement actions urgently will be a significant challenge. The senior officers will require considerable support—above the levels of funding normally provided to other projects—if they are to meet these considerable challenges.

In summary, substantial and decisive action is needed, including early funding, to enable an immediate commencement of the journey of building effective management arrangements. This is essential if Myanmar is to develop the knowledge to undertake the necessary interventions as soon as practicable to stem the tidal wave of trauma it is now encountering.

It is suggested that the government

- establish an executive group and working group to drive road safety management in Myanmar at the national level and then at the regional/state level, starting with Yangon and Mandalay;
- select areas for demonstration projects;
- launch the development of key enabling systems and implement selected priority policy reviews;
- facilitate the RTAD by setting up a road-user-behavior cell;
- establish, with DOH and Traffic Police participation, a road safety unit (the DOH set up one in April 2015, following a first draft of this report);
- implement priority short-term interventions;
- request donor funding through a grant and/or loan to support these actions and build the capacity of the DOH, Traffic Police, and the RTAD; and
- request donors to finance safe-system-compliant roads only.

ADB is providing technical assistance to provide advice and build capacity, and may consider loan financing to launch safety investment programs. ADB will provide in 2016 a capacity-development technical assistance to the DOH and RTAD, under the Technical Assistance for Improving Road Network Management and Safety, and may consider financing road safety improvements.

International financing institutions and/or donors could contribute to this safety agenda by

- financing the safer roads program and demonstration projects (including those establishing enabling systems and policy reviews) in partnership with ADB;
- funding training and transfers of international knowledge, preferably on a long-term basis (up to 10 years);
- helping to raise decision makers' awareness of challenges and solutions;
- ensuring that the road projects they finance are safe-system compliant; and
- providing technical assistance to facilitate the development of road-safety management capacity and institutions, and to facilitate policy reviews and updates.

Introduction

This note presents the first road safety assessment and management capacity review for Myanmar. The study was carried out by Eric Howard (road safety advisor, consultant) for the Asian Development Bank (ADB), in cooperation with the Road Transport Administration Department (RTAD), the Ministry of Transport and Communications (MOTC), and other key government agencies involved in road safety management. The National Road Safety Action Plan (NRSAP), which was adopted in 2014, and the views of the key road safety agencies, which were sought in discussions, were major inputs to this work. The assessment draws from discussions with key departments at the national level in Naypyidaw (with a countrywide focus) and from two workshops in Yangon and Mandalay regions (including city government representatives).

A key objective of the study was to provide a broad review of the road safety situation in Myanmar (Section 1). The study examines a range of road safety issues, including vehicle safety, road design and condition, road signage, driver behavior, and levels of enforcement. This is the first time such a systematic exercise has been conducted in Myanmar. Due to data limitations, the diagnostic was prepared partly through casual observations and interviews. Where possible, findings are benchmarked against the situation in comparable member countries of the Association of Southeast Asian Nations (ASEAN).

A diagnostic of the institutional management arrangements for road safety complements this review (Section 2). It assesses the quality of coordination among institutions, the capacity of institutions, the existence of a framework for results, the adequacy of legislative provisions affecting road safety, and the sufficiency of currently available funding.

This report then discusses guiding principles for building road safety management capacity (Section 3).

These diagnostics and principles support recommendations on priority interventions that could deliver improved road safety performance, and suggestions on possible improvements in the **coordination of mechanisms**. The report then outlines the objectives and components of **possible demonstration projects**, which could be supported by international donors (Section 4).

A first version of this report was shared with the RTAD and presented on 21 February 2015 during a large multi-sectoral workshop. This new version of the report reflects the feedback received during the workshop (Appendix C).

This report forms part of the **Transport Sector Policy Notes**, a series of in-depth reviews of various aspects of the transport sector in Myanmar, carried out by ADB in 2014 and early 2015. It also complements efforts to build the capacity of government officials in the area of road safety in ASEAN nations, which were ongoing at the time of the drafting of this report.

1 Road Safety Situation

Key Findings

Myanmar is at a critical point in terms of road safety. In 2014, road-related deaths reached 4,300, which is twice as many as in 2009. One-third of all injuries reported by hospitals are from traffic crashes. The absolute level of fatalities is not yet as high as in other Southeast Asian countries, but this is mainly because Myanmar's motorization rates are low. Due to underreporting, the true number of annual road fatalities may actually be between 6,200 to 8,200. Fatalities could be expected to double by 2020 and reach 15,000 per year by 2025 if the situation continues unchecked.

An initial review identifies the following factors as causing accidents:

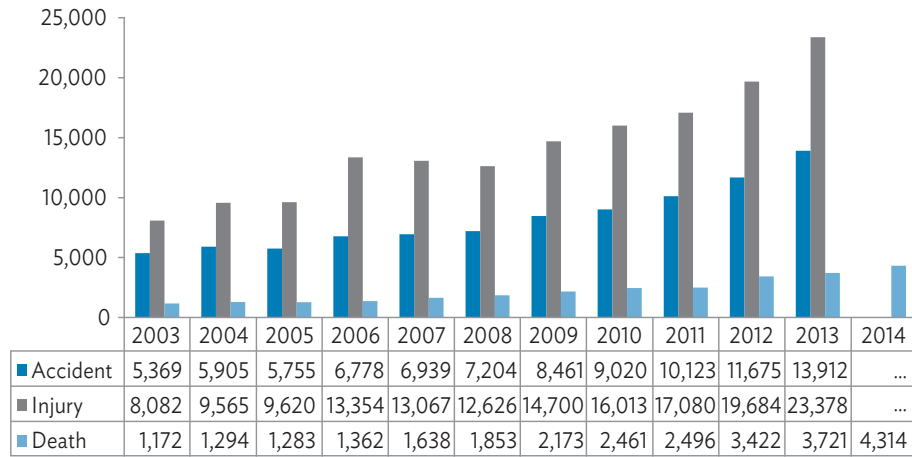
- **Motorcyclists not wearing helmets** is common; it is closely associated with accident severity, which is lower in areas where enforcement is stronger.
- The **vehicle fleet** used to be old, but is now being revitalized, albeit without systematic requirements for safety. Most vehicles are right-wheeled drive (the steering wheel is on the right-hand side of the car when one is seated within it), even though people drive on the right-hand side of the road. On balance, vehicle safety has likely improved between 2010 and 2015, but new safety standards for imported cars are needed.
- **Road infrastructure** is generally unsafe. Road alignments are often dangerous, with a general lack of protection for pedestrians and two- or three-wheelers. These hard-to-fix problems are becoming increasingly critical as more powerful four-wheeled vehicles are becoming more prevalent. Safety equipment is used sporadically, and road markings are inadequate. There are no safety guidelines or requirements for road works.
- **Driver behavior** is generally not as worrisome as in other South and Southeast Asian countries, but speeding (when infrastructure allows it) and not giving way to pedestrians are common. A major issue is that more than 50% of drivers do not have licenses.
- **Enforcement** is generally efficient, but not adequately resourced.

1.1 Road Traffic Accident Statistics

Crash Rates

Traffic-related deaths rates are increasing at an alarming pace. Road crashes, injuries, and fatalities have more than doubled nationally since 2008. Road fatalities had been stable at about 1,300 annually until 2006, when a rapid ascent in numbers occurred. Fatalities increased to 1,853 in 2008, 2,496 in 2011, 3,721 in 2013, and then to 4,313 in 2014. The growth in the level of fatalities from 2013 to 2014 was 16% (Figure 1).

Figure 1: Road Accident Trends in Myanmar, 2003–2014



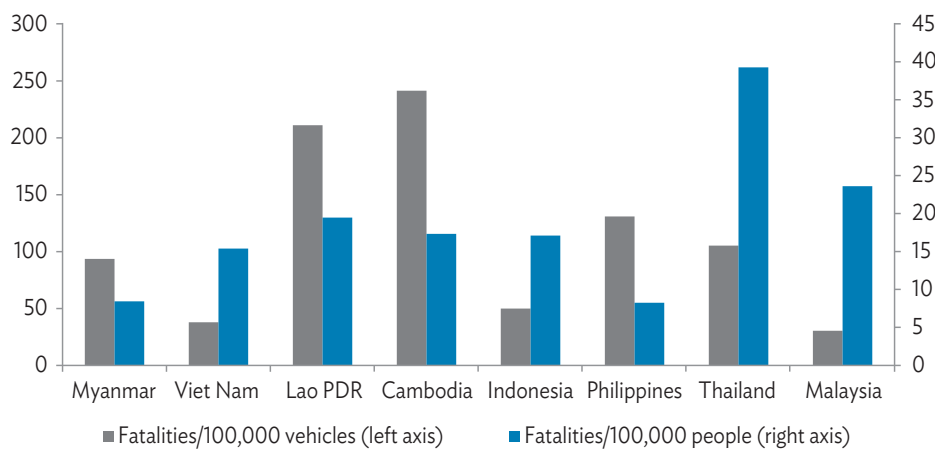
... = data not available.

Source: Government of Myanmar, Ministry of Rail Transportation, Road Transport Administration Department.

The absolute level of fatalities in Myanmar is still moderate when compared with that of similar countries.

The rate of fatalities per 100,000 people was estimated to be 2.5 in 2006. It reached 8.4 in 2014. Despite the increase, this is not currently considered a high rate per 100,000 people on an international comparative basis. In 2010, the Philippines had a fatality rate of 8.3, Indonesia 17.7, Cambodia 17.6, and Thailand experienced a very high rate of 38.8 (Figure 2).

Figure 2: Comparisons of Countries of the Association of Southeast Asian Nations, 2010



Lao PDR = Lao People's Democratic Republic.

Source: Asian Development Bank, drawing from various sources.

Due to underreporting, the total number of road fatalities may well be higher. The World Health Organization (WHO) estimated through regression analysis that the actual number of road fatalities in Myanmar may have been between 6,200 and 8,200 in 2013.¹

The main cause of this increase is rapid motorization. Myanmar's motorization rate is still low, at 89 motor vehicles per 1,000 people, and only 7.7 cars per 1,000 people. The rate of fatalities per 10,000 vehicles remained constant between 2008 and 2014, at 9.3. However, the motor vehicle fleet more than doubled in size during the same period, from 2 million to 4.6 million, leading to a rise in the absolute numbers of fatalities per year.

As the country develops and more people own motor vehicles, it is very likely that the number of deaths and injuries continue to increase, rapidly reaching critical levels. The authors of this report estimate that Myanmar's vehicle fleet may expand by 10%–15% per annum, in a context of liberalization and quick economic development.² Based on the experience of other Southeast Asian countries, unless urgent action is taken, this increased road-accident trend will continue. Should fatality rates per vehicle remain as they are, while the vehicle fleet expands, the number of **road-related deaths in Myanmar could reach 9,000 per year by 2020 and up to 15,000 by 2025.**

Victims of Crashes

Motorcyclists and three-wheel vehicle drivers and their passengers make up the majority of fatalities, with 44% involving a motorcycle and 14% involving a three-wheeler accident in 2013 (Figure 3). Nationwide accident data is collected by the RTAD's local offices. Unfortunately, the crash data does not identify road-user fatalities by category, but instead records the type of vehicle involved in each fatal crash. Pedestrian fatalities are represented by the category of "vehicle and pedestrian" fatal crashes.

Recent data from Myanmar's Ministry of Health confirms that motorcyclists are the predominant group among the injured, representing up to 47% of all injured road users in the major hospitals in 2013. Pedestrians were up to 24.2% of all road users injured in 2013. The numbers of both these categories of injured road users had increased, as a share of overall injured road users in the major hospitals, by more than 20% since 2010. Hospital data shows that **31% to 36% of all injured patients admitted to Myanmar hospitals were from traffic crashes.**

Causes and Types of Crashes

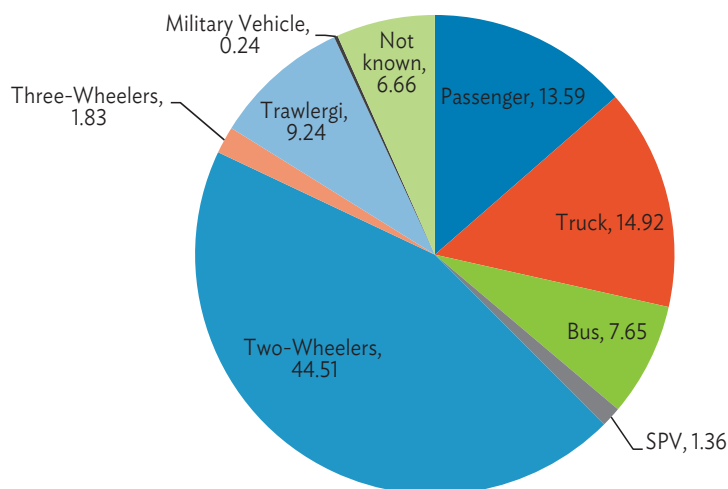
There is only limited information available on the causes of road crashes. In the Magway region, **alcohol** was detected in 60% of injured motorcyclists and the **non-wearing of helmets** was reported in 89% of injured motorcyclists. In Mandalay city, fatalities *declined* in 2013 from 2012 levels and appear not to have increased in 2014. The cause of this positive outcome is not known precisely, but it is believed that the efforts made to achieve higher helmet-wearing rates (as witnessed on the streets of Mandalay and confirmed by the Mandalay Traffic Police chief) are having a positive effect.

Data for the significantly urbanized regions of Yangon, Naypyidaw, and Mandalay identify accidents involving vehicles and pedestrians (and involving vehicles and other vehicles). Unfortunately, information on the type of vehicle involved in each fatal crash (car, truck, or motorcycle) could not be obtained from the available data.

¹ World Health Organization (WHO). 2013. *Global Status Report on Road Safety 2013*. Geneva.

² ADB. 2016. *Myanmar Transport Sector Policy Note: Trunk Roads*. Manila.

Figure 3: Traffic Fatalities by Vehicle Involved, 2013
(%)



SPV = special purpose vehicle.

Notes:

1. A *trawlergi* is a small farm utility vehicle.
2. A special purpose vehicle is a nonagricultural motor vehicle or trailer used for purposes other than transporting goods (e.g., a crane or drill rig).

Source: Government of Myanmar, Ministry of Rail Transportation, Road Transport Administration Department.

The major fatal crash *types* (head on, vehicle hitting pedestrian, right-angle intersection crashes, run off road, rear end) in these three regions could also not be extracted from the available data.

1.2 Vehicles and Infrastructure

Vehicle Safety

Discussions with government officials showed that the legislative requirements for the safety of vehicles supplied to the Myanmar market remained limited, and so was the knowledge about promoting the safety of vehicles (based on national crash assessment programs and published material from programs in other countries). There were as yet no programs to promote public awareness of the importance of vehicle safety so as to reduce the risk of dying in a vehicle crash.

The most visible example of this situation is that reportedly **90% of the vehicles in Myanmar are right-hand drive**, even though they drive on the right-hand side of the road. This is because most vehicles are imported from the used car market in Japan.

Based on observations of the current fleet and on discussions about the comparative condition of the fleet as it existed in 2012, it is concluded that recent imports have served to improve the crashworthiness (safety)

of the fleet. Until 2012, strong restrictions on car imports had led to most vehicles on Myanmar's roads being very old. In 2012, the government facilitated the import of vehicles and implemented an old-vehicle scrapping program. This led to the replacement of old vehicles by more modern and safe ones.

It is likely that using a steering wheel configuration that is at odds with what the roads are designed for comes with safety implications (particularly regarding overtaking and bus loading and unloading). Crash data on this point has been lacking, and second-hand (used) right-hand drive vehicles have been widely popular for their affordability. However, it is understood that legislation requiring all future imported vehicles to be left-hand drive is to be introduced shortly.

Infrastructure Design and Safety Conditions

The Department of Highways (DOH), under the Ministry of Construction, does not have any specific road safety guidelines that it applies to road design.

Roadside barriers are used intermittently. Specifically, “W” beams are in place along some curves on the Yangon–Mandalay Expressway, and sections of concrete barrier are used in a spaced manner along some other expressway curves, which is a dangerous practice. There is some evidence that there is infill construction of barriers taking place along some sections to provide a continuous barrier.

Bridge parapet end posts are wholly unprotected, save for some concrete pillars of parapet height on the approaches to the bridges and sections of concrete barrier at right angles (or at roughly 60-degree angles) to the direction of the traffic flow on the approaches to the bridges. This is a dangerous practice, and a one-vehicle collision with bridge end posts on the national highway was observed. The solution is relatively straightforward: installing W beams on the approaches to bridge parapets at an angle of some 15 degrees to the direction of traffic flow on each side of the carriageway for 50 meters, and then connecting to a bridge's parapets.

Substandard curves, which result in a lower safe speed of travel, appear to be more frequent on the Yangon–Naypyidaw section of the Yangon–Mandalay Expressway, compared with the Mandalay–Naypyidaw section. These curves are poorly designed and are not constructed consistently for a certain maximum speed. They are of different radii and should often be signed with a speed limit of 80 kilometers per hour (km/h) or 70 km/h, rather than the posted 100 km/h.

The wire mesh fence installed along the expressway reserve boundaries—in certain locations where there are settlements or a desire for local access to the road—has been cut away in many places by enterprising locals who establish shops selling refreshments to travelers behind gaps in the fence. This results in a lower level of safety, as vehicles leave or enter the carriageway with no provision for acceleration or deceleration lanes. This growing trend will undermine the purpose of a limited access road; and if it is not actively curtailed, it will grow rapidly and serve to undermine respect for the rule of law regarding road use more generally.

Pedestrian facilities are very poor. Footpaths are often nonexistent along the higher-speed sections of arterial roads within the outer limits of urban areas. Pedestrian crossings are often inadequate on these outer urban roads, which have higher travel speeds than inner urban roads. Only a few bars of yellow paint at widely separated locations along the roads define the pedestrian crossings. There is often no adequate advance signage, no signage at the crossings, no lighting, and no elevated roadway platforms to draw the driver's attention to the presence of crossings.

Substantial safety challenges were observed on roads in rural areas, with higher-speed travel being observed on these roads, well in excess of the safe system limits in the event of a crash.

Road Signage

There is an obvious absence of warning signage on the road network, which compromises road safety and increases the risk of crashes. Chevron markers are not used at curves, delineation through the use of guideposts and reflectors are not used, and tactile edge lines or centerlines are also not in use.

Basic curve warning signage is in use on the high-speed limited access to the Yangon–Mandalay Expressway. However, advisory speed signage—a plate displaying the recommended (safe) travel speed for the curve placed below the curve sign in some countries—does not exist in Myanmar. This is a major opportunity lost, as the safe speeds around many of the curves are far less than the 100 km/h speed limit for the road as a whole.

Direction signage in advance of intersections, and reassurance signage for motorists giving distances to destinations ahead, are limited. Advance signage for pedestrian crossings in urban areas and for intersections in urban and rural areas was not evident.

1.3 Driver Behavior

The overall behavior of most drivers and riders is not (yet) as worrisome as in a number of other Southeast and South Asian countries. The rule of law still holds sway for most road users.

On higher-speed roads (e.g., the Yangon–Mandalay Expressway), motorists have the unusual custom of putting on their indicator lights to advise those traveling behind them that they may overtake them. This could be problematic for future drivers from other countries who would normally use the indicator signals to notify the drivers behind them that they are simply moving out of the lane. Moreover, speeding on the expressway was noted, with some drivers traveling at 130 km/h.

Alcohol-impaired driving is not considered a major issue by the authorities, but as impaired levels are measured and detected from breath tests of only some drivers after crashes, this assessment may be understating the scale of the problem.

Pedestrian safety is heavily compromised by drivers' not giving way to pedestrians at crossings; instead, drivers tend to pass perilously close to young and old pedestrians, with the attitude that “no offence is being committed” unless they strike a pedestrian at the crossing. Improved enforcement to bolster safe behavior by motorists at crossings was also not evident.

The acceptance of these practices and behaviors is the result of a long period during which road managers and the public grew accustomed to these unsafe practices. Attitudes need to be challenged, and drivers must recognize the unacceptable crash risk for pedestrians posed by these situations (or by the lack of proper facilities). Indeed, it could be argued that no amount of paint on the road can justify the current practice of encouraging pedestrians to rely on that paint to protect them when crossing. Effective infrastructure and law enforcement responses to these unsafe practices are available, and should be a high priority.

Unlicensed Driving and Riding

The Traffic Police has expressed its concern that some **50% of drivers and motorcycle riders are unlicensed, and that many of them have never been licensed.** This is a major issue that must be addressed if drivers and riders are to be brought within the usual enforcement-and-deterrence model to achieve safe behavior, particularly as more electronic enforcement is introduced.

This is partly an enforcement resourcing issue. The implementation of portable electronic systems to detect vehicle registration plate numbers (and the name and license status of the associated registered operator of the vehicle—usually the rider or driver) is one effective countermeasure being used in many countries. It was noted that highway police were checking licenses at the Mandalay end of the Yangon–Mandalay Expressway. It was also noted that the police will now not only arrest unlicensed riders and drivers, but will also confiscate their vehicles. This approach has proven to be an effective deterrence against many serious offences in a number of countries.

Helmet-Wearing Rates

The rate of helmet wearing varies depending on the local police and authorities' efforts to achieve improved helmet-wearing rates. As an example, the helmet-wearing rate (based on surveys) in Magway Region was 26% in 2012, according to the Myanmar Health Department. It is interesting that the rate of helmet wearing by those arriving injured at the Magway hospital was much less: 11%. Helmet wearing rates observed in downtown Mandalay exceeded some 60%, while the rates in Sagaing Region and in some rural areas were estimated at less than 20%.

Achieving increased helmet-wearing rates is a particular problem in the rural areas of all countries, and Myanmar is no exception, based on police reports. The police in Mandalay Region have conducted village-level educational programs, and these programs should be expanded.

Motorcyclist safety is a major issue for Mandalay city, with some segregated roadways for motorcycle use in place and robust efforts being reported by the police to improve helmet wearing. This is not a required focus in Yangon, where motorcyclists are excluded from the major part (the central 31 townships) of the city.

1.4 Levels of Enforcement

There is a clear intent on the part of the Traffic Police Command to improve enforcement effectiveness and scope, confirmed by senior traffic police in Yangon and Mandalay. Policemen were observed checking licenses at a toll booth on the Yangon–Mandalay Expressway, and local traffic police were observed patrolling and conducting license inspections in Naypyidaw. A police presentation at a Mandalay workshop that was a part of this assessment demonstrated how substantial efforts were being made by the police in Mandalay Region to improve their contribution to road safety.

Less than two-thirds of the 3,400 traffic police positions within Myanmar are actually filled at present, with a number of reasons having been given for this situation. Myanmar must ensure that its traffic police operations are fully staffed as a priority.

2 Road Safety Management Institutions

Key Findings

Since 2014, Myanmar has had a robust institutional architecture for road safety management in place. It is in the form of the Myanmar Road Safety Action Plan (MRSAP) 2014–2020, piloted at a high level by the National Road Safety Council (NRSC), and coordinated on the ground by existing regional and state Traffic Rules Enforcement Supervisory Committees (TRES Cs). The MRSAP specifies the following targets:

- 50% reduction in total fatalities,
- 50% reduction in the per-vehicle fatality rate,
- 90% helmet-wearing rate,
- 70% seat-belt-wearing rate, and
- the elimination of unlicensed driving.

The following institutional weaknesses will need to be addressed in order to improve the safety situation:

- poor crash data systems;
- weaknesses in the relevant legislation;
- the need for more funding for safety management;
- the lack of capacity to assess infrastructure crash risks and to design and evaluate measures to reduce these risks (e.g., vehicle speed restrictions, black spot treatments);
- the lack of capacity to identify dangerous road user behavior and to guide road user policy development (e.g., licensing policy, roadside operations, parking, etc.);
- a major shortfall in filling approved positions within the Traffic Police;
- the need to measure and improve the safety standards of new vehicles;
- the need for improved post-crash care; and
- limited clarity in the allocation among departments of responsibilities for safety

The realization of the MRSAP requires building a better capacity for policy formulation and implementation, without which the NRSC and the TRES Cs will not be able to act. Despite the good cooperation among agencies, the complexity of existing government arrangements regarding ministry responsibilities will likely be an impediment to successful road-safety efforts.

2.1 Institutional Organization and Distribution of Responsibilities

Institutions

Road safety management leadership is shared between the Road Transport Administration Department (RTAD), under the Ministry of Transport and Communications (MOTC), and the Myanmar Police Force, under the Ministry of Home Affairs.

At the local level, road safety actions in Myanmar have traditionally been carried out through a region's or a state's TRESA. A TRESA is an active body at the regional/state level (certainly for Yangon and Mandalay regions) that monitors road user behavior, reacts quickly to identified unsatisfactory physical situations on the roads, and seeks modifications of penalties and of legislation if considered advisable. This is commendable, but limited in scope. The membership of a TRESA is made up of government agency representatives at the national and regional/state levels, as appropriate. It is understood that the focus of each TRESA has been operational.

Myanmar Road Safety Action Plan

President's Office Notification No. 44/2014, in mid-2014, proposed the Myanmar Road Safety Action Plan 2014–2020 (MRSAP).

Objectives. The overall objectives of the MRSAP are to reduce the loss of life, the negative socioeconomic impacts on the public, and the negative environmental impacts and traffic congestion that road crashes can cause. The Action Plan seeks to reduce road fatalities by 50% during 2014–2020 and specifically targets five objectives:

- to reduce the annual growth rate of road crashes in order to halve the 2014 level of fatalities by 2020,
- to reduce the fatality rate per 10,000 vehicles by 50% by 2020 from the 2013 level of 9.26,
- to achieve a 90% motorcycle-helmet-wearing rate all over the country,
- to achieve a 70% seat-belt-wearing rate all over the country, and
- to eliminate illegal driving (i.e., without a driver's license).

Actions are to be carried out under the following 12 identified categories:

- Coordination and Management;
- Traffic Legislation;
- Vehicle Safety Standards;
- Driver Training and Testing;
- Safe Planning and Design of Roads;
- Improvement of Hazardous Locations,
- Publicity, Campaigns, and Road Safety Education for Children;
- Police and Law Enforcement;
- Accident Data System, Road Safety Research, and Road Accident Costing;
- Emergency Assistance to Road Accident Victims;
- Road Safety Funding and the Role of Insurance; and
- Cooperation and Collaboration.

The MRSAP states that a successful implementation of road safety actions to improve performance is to be undertaken not only by the specific departments or organizations, but also through collective cooperation among concerned parties. It requires multi-sectoral cooperation in which government, nongovernment organizations (NGOs), and private sector organizations are included. This multi-sectoral cooperation should pave the way for the implementation of actions in order to achieve the targets.

National Road Safety Council

The **National Road Safety Council** (NRSC) was established by the President's Office Notification No. 44/2014. This very high-level council is to be chaired by the Vice-President of Myanmar. The minister of home affairs and the minister of rail transportation were nominated for the two vice-chair positions.³

The specific responsibilities of the NRSC are detailed as follows:

- to implement land transport safety policies;
- to define clearly the responsibilities of the relevant departments with regard to the successful and effective implementation of the Road Safety Action Plan, 2014–2020;
- to seek funding and human resources for the implementation of road safety measures and to scrutinize the effective use of the resources;
- to report any difficulties encountered during the implementation of road safety actions;
- to carry out public awareness campaigns about road safety problems that are impediments to improving public health and national economic development;
- to raise funds for the road safety action program from contributions by national and international donors;
- to evaluate whether road safety actions are implemented within the targeted time and to monitor and modify the action programs to respond to changed situations;
- to seek technical assistance for the implementation of road safety measures;
- to reduce environmental damage arising from the use of vehicles;
- to reduce traffic congestion; and
- to facilitate research on the improvement of road safety, including through legislative changes, when necessary.

The intention is to establish similar overarching senior-level councils in the near future at the regional/state level.

³ NRSC membership includes a large number of ministers, specifically those of the Ministry of Information, Ministry of Transport, Ministry of Education, Ministry of Health, and the Ministry of Construction; as well as deputy ministers from the Ministry of Defense, Ministry of Border Affairs, the President's Office, Ministry of Industry, Ministry of National Planning and Economic Development, Ministry of Social Welfare Relief and Resettlement, and the Ministry of Science and Technology. The mayor of the Mandalay City Development Committee, mayor of the Yangon City Development Committee, chair of the Naypyidaw City Development Council, and the chair of the Myanmar Federation of Chambers of Commerce and Industry are also members. The deputy minister of the Ministry of Transport and Communications and the general of the Myanmar Police Force are the secretaries of the NRSC, while the director general of the RTAD, Ministry of Transport and Communications, is the joint secretary.

2.2 Diagnostic Analysis of Road Safety Management

The Existing Road-Safety Management Situation

The major current focus of the agencies with road safety responsibilities tends to be on operational functions and their improvement. **A strategic overview is lacking, however**, particularly with regard to the recognition of the **safe system** approach, and what a coordinated application of it would mean for the day-to-day work of each of the agencies. This is understandable, given that Myanmar is in the early stages of its awareness of safe systems, but significant movement forward is urgently needed. Carrying out operational functions as efficiently as possible is important, but larger issues need to be addressed.

The complexity of existing government arrangements regarding ministry responsibilities is likely to be an impediment to successful, focused road-safety efforts at the senior level. At the local level, the new MRSAP President's Office Notification envisages the TRES Cs in each region and state taking on the responsibility for action plan implementation and for reporting on their progress to the NRSC. However, it is understood that policy development and implementation at the regional/state and national levels are not completely carried out by the TRES Cs, nor are these responsibilities within the TRES Cs' current capacities.

Overall, a review of overall road safety governance and management is required. Senior and middle-level management were open to considering change and genuinely interested in improving services and skills.

Coordination among Institutions

There was evidence of cooperative effort to varying degrees at the regional/state level (Yangon and Mandalay) and between the RTAD and the Traffic Police at the national level. Indeed, all departments attended the workshops at the national level and were represented at the regional level at the workshop in Mandalay.

However, there is a need for road safety partnerships across government agencies to be strengthened. The effective operation of the NRSC and its relationship with potential executive and working groups, including the TRES Cs have yet to be agreed upon and implemented.

It was suggested that regional and state Road Safety Councils were likely to be established. Again, it will be important to ensure that **working groups** are established to support decision making and implementation at the regional/state level.

The Capacity of Institutions

The relevant government agencies have an operational focus, but some of the key ones—the RTAD, Traffic Police, and the Ministry of Health—certainly recognize the need to build their knowledge and awareness and to strengthen their capacity to implement the action plan and other measures.

Road Infrastructure. The Department of Highways (DOH) does not yet have a substantial appreciation of the safe system approach (in common with other agencies), nor of what its adoption would mean for their work as a road construction and operating authority. To address their lack of consideration for road safety during road project implementation, these agencies face the immediate challenge of developing safety

guidelines for application to new and retrofitted designs and to the operations of the network over time, so as to adhere to good international practice. There is also a need to develop traffic engineering expertise to enable the implementation of traffic safety management based on good engineering practices on the rural and urban networks.

Licensing arrangements would benefit from a high-level review that could identify longer-term alternative license preparation and novice driver models, which would provide guidance for interim steps to be taken in the short term.

There are a number of issues that will have to be addressed if the Traffic Police is to be supported in its efforts to prevent unsafe road user behaviors, a critical issue for the task of limiting the expected major increases in fatalities.

Framework for Results

The MRSAP includes a strong framework for results. It sets out 101 actions—specifying the responsibilities of all relevant organizations regarding the implementation of each action—for short-term (2015), medium-term (2017–2018), and long-term (2020) time frames. The MRSAP’s specific targets to be achieved by 2020 include the elimination of unlicensed driving, as well as a

- 50% reduction in fatalities,
- 50% reduction from the 2013 level of 9.26 deaths per 10,000 vehicles,
- 90% helmet-wearing rate, and a
- 70% seat-belt-wearing rate.

These are inspirational targets and objectives. The first target, a 50% reduction in fatalities, is much more ambitious than the second target, halving the accident rate per vehicle, because the vehicle fleet may double in size by 2020. Should the second target be achieved, the number of fatalities would simply be stabilized, which would already be a major achievement. To support this achievement and the implementation of the 101 detailed actions, the following will be needed:

- The staff of key road safety organizations would have to be trained in: safe system thinking, crash risk identification across the road network and its variation across the network (especially for infrastructure safety standards), awareness of available evidence-based road safety interventions, how to select the interventions that will effect the greatest possible reduction in crash casualties and that will be supported by the community, and how to gain government support for funding and for achieving necessary legislation.
- A decision-making, consultation, technical, and management support framework would have to be established for effective road-safety-management operations, including the mentoring of the lead agency at the national and regional/state levels.
- All the activities necessary for the completion of each action under the MRSAP, and the amount of time required for those activities, should be identified, as there could be as many as 20 or more activities for many of the actions. This is a major task that has to be informed by an understanding of the necessary activities required. An example from another country is presented in Appendix C.
- It would be desirable to have technical assistance for the key agencies over a period of time sufficient for developing sustainable capacity within the agencies.

The Adequacy of Legislative Provisions Affecting Road Safety

The existing legislation is sound, but it is insufficient for achieving the level of road safety performance sought by the MRSAP. For example, rear seat belt wearing (where belts exist) is not yet mandatory. There is substantial scope and a clear requirement to do much more.

The Adequacy of Levels of Currently Available Funding

Much greater investment and resourcing is needed to provide: the required crash data system; effective training in technical and management skills; the scope for on-the-ground *learning by doing* for road authorities, police, and transport staff; the development of responsive emergency procedures for the retrieval of crash victims; and improved hospital trauma management.

Further substantial funding will also be needed to implement the retrofitting of existing unsafe sections of the road network on a crash-risk-priority basis.

Key Weaknesses Arising from Inadequate Management Arrangements

The key weaknesses that were identified by the RTAD and presented during the initial assessment workshop were

- poor data systems;
- weakness in comprehensive legislation;
- the need for increased funding;
- the need for a greater promotion of public transport use;
- the need to separate vulnerable road users from car, bus, and truck traffic;
- the need for improved post-crash care;
- a lack of involvement of the private sector;
- the need for measurable targets for the major road-user-behavior risk factors (i.e., speeding, drunk driving, not wearing seat belts, not wearing motorcycle helmets, and the non-use of child restraints); and
- the lack of effective and scalable implementation to address these risky behaviors.

Other specific weaknesses identified during the assessment included

- the need to determine fatal and serious injury crash risk due to a combination of infrastructure safety and travel speeds, and to learn to respond to this risk, using such methods as reviews of speed limits in urban and rural areas to reduce the fatal crash risk;
- the need to measure the safety standards of new vehicles entering the fleet;
- the major shortfall in filling approved positions within the Traffic Police;
- the absence of a component within the RTAD to monitor road user behavior, guide road user policy development (e.g., for licensing), and work with road authorities to maintain acceptable roadside behavioral practices (e.g., market operations, trader operations on the footpaths, bus behaviors, and vehicle parking); and
- the need for facilities and interventions to reduce pedestrian and motorcycle fatal crash risks, as well as the separation noted in the prior paragraph.

Awareness of Responsibilities

A series of questions was presented at the workshops in Naypyidaw and Mandalay to encourage those present to consider the issues of responsibility and accountability over the short term. It was not possible in the time available to discuss these questions exhaustively, but participants noted that the questions did indeed provide food for thought. The questions conveyed a sense of the scale of the challenges ahead. They were as follows:

- Does any department (at the regional/state level) have a map of road crash locations for that region or state?
- How are proposed changes in legislation identified at the regional/state level promoted for acceptance at the national level?
- Which department has responsibility for
 - preventing landowners from cutting holes in the road reserve fencing along the expressway;
 - preventing traders from setting up shops and attracting customers through gaps in the road reserve fence;
 - ensuring that motorcyclists and other slow-moving vehicles do not use the expressway;
 - verifying the appropriateness of the speed limits, given the safety characteristics of the infrastructure and the mix of road users at different locations;
 - taking care of the traffic signage and line marking (initial installation and ongoing maintenance) on the roads;
 - providing for the safe passage of pedestrians when crossing a road or walking along a roadside;
 - providing separate right-of-way on roads for motorcyclists;
 - preventing vehicle occupants from striking bridge end posts;
 - preventing roadside markets from operating on the major arterial roadsides;
 - preventing traders from fully occupying footpaths and forcing pedestrians onto the roadways;
 - ensuring that bus drivers have bus bays for picking up passengers;
 - ensuring that the bus bays are kept clear of traders and parked vehicles so that they can be used by buses;
 - ensuring that bus drivers actually use the bus bays for picking up and letting off passengers; and
 - supporting recommendations for funding improvements in road safety management and outcomes?

This list is not exhaustive, just illustrative. The issues they cover are indicative of the road-safety-management challenges and associated responsibilities that must be addressed—along with many others—if road safety performance is to be improved in the medium term.

3 Road Safety: Managing for Results

Key Findings

Myanmar needs to shift from a traditional approach focused on users to a “safe system” approach. The current “blame the road user” attitude prevails in the public mind and in the thinking of Myanmar road safety professionals—as it does in many other developing countries. Under a safe system approach, a major share of the responsibility is shifted from the road users to those who design the road transport system.

International research and practice has shown that the levels of infrastructure safety, the associated safety of travel speeds along that infrastructure, the safety features of vehicles, and the quality of post-crash victim retrieval and care—all in combination—contribute more to the reduction of fatalities and serious injuries than does the reduction of illegal road-user behavior (or the increase of safer road users). The individual road users are responsible for abiding by the laws and regulations. Road managers and other public actors are responsible for providing a safe transport system.

In 2011, the United Nations launched the Global Plan for the Decade of Action for Road Safety 2011–2020. The five pillars of the plan are (i) road safety management, (ii) safe roads and mobility (with regard to travel speeds), (iii) safe vehicles, (iv) safe road users, and (v) safe post-crash response. All these pillars are relevant to Myanmar’s efforts to lower its crash risks.

3.1 Road-Safety Management System Concepts

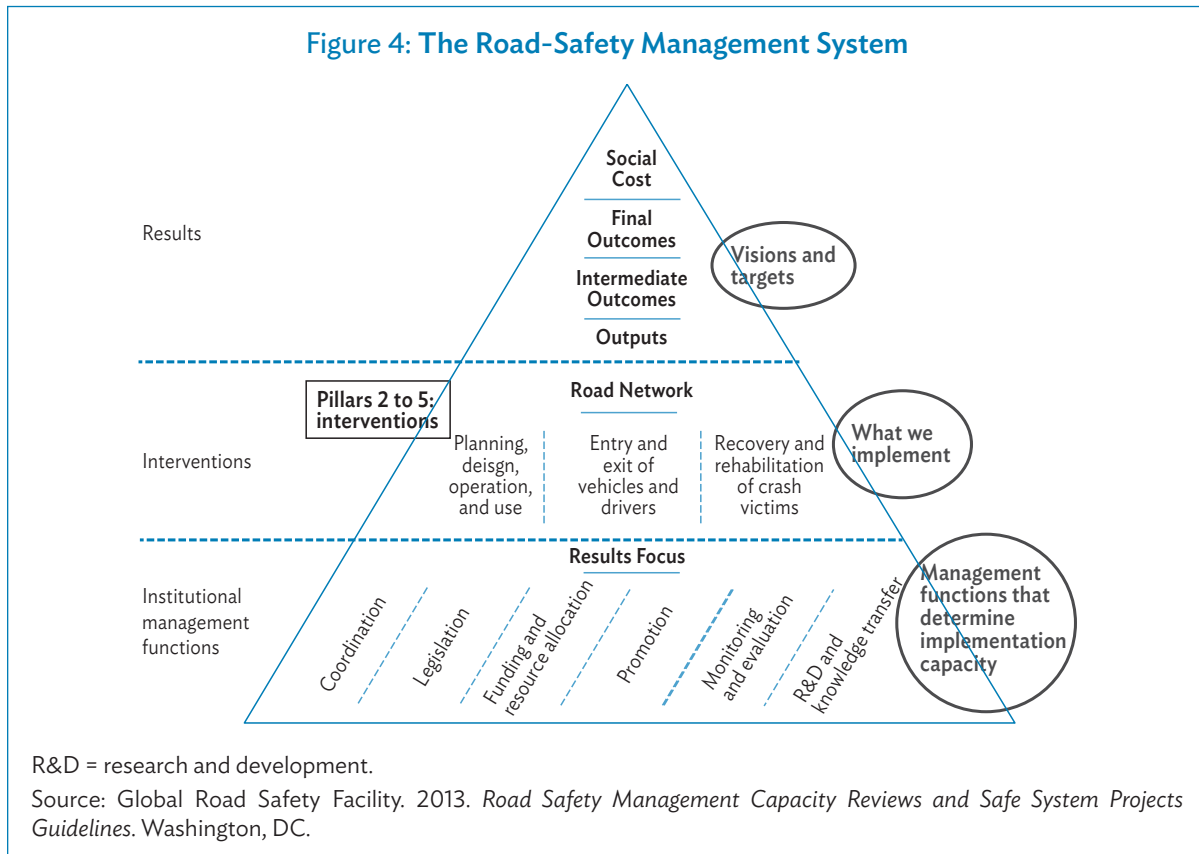
The five pillars of the United Nations (UN) Global Plan for the Decade of Action for Road Safety 2011–2020 require concerted efforts by the relevant road safety agencies in Myanmar to lower the overall road crash risk along the network.⁴

Road Safety Management

The UN Global Plan’s first pillar is road safety management because the quality of the management system directly relates to the quality of interventions, and to the results that are achieved. International thinking on road safety emphasizes the building of institutional capacity for road safety management, and places importance on the role of the lead agency.⁵

⁴ World Health Organization. 2010. *Global Plan for the Decade of Action for Road Safety, 2011–2020*. Geneva.

⁵ Global Road Safety Facility. 2013. *Road Safety Management Capacity Reviews and Safe System Projects Guidelines*. Washington, DC. This section draws on this publication.



A road safety management system can be viewed as comprising institutional management, interventions, and results. The relationship among those three components is shown in Figure 4.

Under the UN Global Plan, the critical functions of institutional management to be developed across a government are as follows:

- a focus on clear results (leadership, objectives, targets, an action plan for the medium term, and capacity development in the short term);
- coordination of government-wide efforts, with community consultation;
- legislation and enabling systems;
- funding and resource allocation;
- promotion of road safety opportunities to ministers, senior officials, and to the community;
- monitoring and evaluation of the management system, as well as critical interventions; and
- research and development and the transfer of knowledge.

The Safe System Approach

The guiding principles underlying the UN Global Plan are those included in the “**safe system**” approach. This approach considers the fact that road users make mistakes; that they are vulnerable; and that they share the responsibility for road safety with those who provide the roads, vehicles, and relevant services. It therefore

aims to develop a road system that takes into account the types of errors users may make, with the objective of reducing the frequency and consequences of these errors. Road users, vehicles, and the road network and environment are all addressed in an integrated manner, through a wide range of interventions, and with great attention to speed management and vehicle and road design, in contrast to the traditional approaches to road safety.

This approach means that road system providers share a major portion of the responsibility for crashes.

Road system providers mainly include: the government agencies in charge of roads, the vehicle providers and regulators, the police, and the legislative bodies that empower them. Many other actors also share a part of the responsibility for road problems and their solutions: health services, schools, the judicial system, etc. Users are responsible for abiding by the laws and regulations.

Do not focus solely on users. International research and practice has shown that the levels of infrastructure safety; associated safety of travel speeds on that infrastructure; safety features of vehicles; and quality of post-crash victim retrieval and care—all in combination—contribute more to the reduction of fatalities and serious injuries than does the reduction of illegal road-user behavior (or the increase of safer road users). To focus only on road-user behavior is to ignore more than 50% of the potential solutions .

This is not understood in most developing countries, including, to a large extent, Myanmar. The “blame the road user” attitude usually prevails in the public mind and in the thinking of road safety professionals. While continued efforts to improve road user compliance are essential, Myanmar also has much to do to improve performance in the other core safe system areas (safer roads and mobility, safer vehicles, and post-crash response), which, in combination with road safety management, comprise four of the five the UN Global Plan safe system pillars. The remaining pillar is safer road users.

3.2 Building Road-Safety Management Capacity in Myanmar

Building road safety management capacity in low- and middle-income countries to achieve road safety goals requires a systematic response and sustained long-term investment. Critical issues at the country level are how to build capacity through institutional reforms, how to accelerate knowledge transfer; how to scale up investment, how to increase international cooperation and development aid sustainably, and how to allocate increased resourcing from the government over time.

It is clear that Myanmar, at present, has inadequate road safety management arrangements in place. The management system established under the Myanmar’s National Road Safety Action Plan (NRSAP) is expected to reflect the underlying philosophy and approach set out in the UN Global Plan for the Decade of Action for Road Safety 2011–2020, in order to

- promote and lead the implementation of the NRSAP;
- ensure that the necessary legislation and other enabling systems are in place to underpin the delivery of key road safety interventions under the plan;
- acquire substantial funding and resourcing;
- coordinate the development and delivery of action plans;
- increase the effectiveness of interventions targeting the safety of roads, vehicles, and people, as well as emergency management; and

- undertake the necessary monitoring, evaluation, research, and knowledge-transfer tasks to sustain continued investment and improvement.

The risk is that these arrangements remain only formal. The NRSAP establishes high-level management arrangements and a very ambitious set of targets and actions. However, operational mechanisms for arriving at decisions and implementing actions are lacking. These elements are not integrated and supported by robust institutions. While basically sound, Myanmar's road safety arrangements need improvement in order to meet good international practices.

The RTAD identified the following needs at the 10 December 2014 workshop in Naypyidaw. They are all important road safety management issues:

- funding;
- soft and hard infrastructure;
- human resources;
- know-how and expertise;
- the creation of necessary mindsets and cultures;
- consolidated collaboration among the government, citizens, and other stakeholders; and
- the rule of law and enforcement of the law.

Increased investment in road safety in Myanmar should focus initially on measures to build capacity, and then move on to resourcing the implementation of the action plan as the levels of knowledge and capacity of the key road safety agencies develop. Government agencies at the national and regional/state levels will need to respond to different pressures, so separate management arrangements and separate support will be necessary for the two levels—at least in the cases of Yangon and Mandalay regions.

4 Improving Road Safety Performance

Key Suggestions

This report suggests the following objectives to be achieved through governmental action:

Objective 1: Strengthen road safety management capacity in Myanmar. A road safety decision-making mechanism should be established, operating under the National Road Safety Council (NRSC). This structure should be composed of interagency executive working groups and technical groups, incorporating new consultation arrangements with stakeholder groups and experts; and similar structures should be created at the regional/state level.

Objective 2: Establish the Road Transport Administration Department (RTAD) as the lead agency. The RTAD should be designated the lead road safety agency, and be tasked with supporting this road-safety-management architecture. From this starting point, the RTAD should redefine its formal objectives, functions, and resourcing requirements. As a priority, it should establish a road-user-behavior cell. This does not mean that the RTAD should take over all safety responsibilities. For instance, the safety design and auditing of national highways should be the responsibility of the Department of Highways (DOH).

Objective 3: Develop and implement demonstration multi-sectoral interventions. The preferred way to operationalize these coordination arrangements is to work on pilot projects, with successful project implementation to be replicated across the country. Three locations for projects are proposed: (i) on a rural highway corridor to develop a comprehensive set of interventions to improve the safety of all users, (ii) on a selected outer urban arterial road (in Yangon) to improve pedestrian safety, and (iii) on a selected section of an urban area (within Mandalay) to improve motorcyclist safety.

Objective 4: Create a national “safer roads” investment program. A dedicated program run by the DOH with clear objectives and identified resources should target the infrastructure part of the problem. Such a program could include the installation of safety features, black spot treatments, and junction improvements. The DOH has already set up a road safety unit, and now needs to equip it with safety engineering skills, tools, and processes.

Objective 5: Identify and deliver “enabling” system developments at the national level, such as: a road accident database, road safety audits, a crash risk assessment of the network, and the identification of risk-prone areas.

Objective 6: Identify and conduct selected policy reviews at the national level, such as reviews of penalties, licensing policy, vehicle safety standards, heavy vehicle safety management, and crash investigation methods.

Objective 7: Accelerate road-safety knowledge transfer. A significant part of the road safety efforts should be devoted to raising the capacity and awareness of good safety practices within the RTAD, DOH, the police, and the traffic management committees.

4.1 Suggested Objectives for Government Action

This road safety assessment and management capacity review recommends that government action be taken on the seven needs listed on page 19. These issues are interrelated and mutually reinforcing. The aim is to create a project that encourages agencies to work together constructively to: deliver and evaluate a set of well-targeted, best practice multi-sectoral interventions in identified higher-risk corridors or urban areas; improve the delivery of enabling systems; conduct further policy reviews; and accelerate road-safety knowledge transfer.

4.2 Coordination Arrangements

There is a need for the decision-making processes within government to provide for more regular and workable monitoring and decision making on road safety matters than will be feasible for the formal National Road Safety Council (NRSC)—and potentially for similar formal councils at the regional/state level. While the Traffic Rules Enforcement Supervisory Committees (TRES-Cs) fulfill a valuable operational role at the regional/state level, and their key roles need to be continued in some form, there remains an important need for a broader yet flexible decision-making mechanism, vertically and horizontally, within government.

Proposed National-Level Structure

An **executive group** should be formed as a subset of the NRSC, and at the region/state level, either as a subset of or substitute for the regional/state road safety committees. It would refer certain matters to ministers or to the NRSC, and convey their decisions or those of the government to the members of the implementation body.

A fully resourced executive group consisting of a minister as chair, key departmental directors general, and the chief of the Traffic Police should be formally established to lead the development of road safety management—particularly the coordinated decision making regarding recommended polices, guidelines, and interventions; legislation and funding; the promotion of road safety measures to ministers and to the community; monitoring and evaluation of performance; and on fostering research and development and knowledge transfer, initially through the delivery of components of demonstration projects (see Section 5 for examples). The executive group would meet quarterly.

It is recommended that a **working group** of senior managers from across the core road-safety agencies meet to develop proposals for new or revised policies or other actions. The working group would be composed of staff from the same departments as the executive group, but at the director level (involving any others when necessary). The working group would be chaired by the director general of the RTAD, meet monthly (though more frequently if required), and report to the executive group. The role of the working group would be to provide the hub and support for the coordination of demonstration projects, the enabling systems and policy review processes for the national road-safety management groups, and the building of road safety knowledge within the government at the national or regional/state levels. The outputs of the working group would comprise recommendations for proposals and reporting on progress and emerging issues. The working group members would attend the executive group meetings.

The executive group and working group would also share the responsibility for implementing the Myanmar Road Safety Action Plan (MRSAP), in particular the priority actions identified later in this report.

This working group would be supported by a number of **technical working groups**, which would bring separate agencies and departments together over specific issues, to develop new policy suggestions and to report regularly on the implementation of road safety initiatives that had been developed by that group. Expert advice could be provided to and through those technical working groups. These groups would meet as necessary to complete their tasks. This activity would augment the ongoing and new work conducted by each agency that is essentially the complete responsibility of that agency. Reports on the progress of each agency's work would be provided regularly to the working group.

Management and administrative support and coordination for the executive, working, and technical groups would be provided by a dedicated unit to be established within the RTAD (the lead road safety agency).

In addition to its existing road-safety-related responsibilities, the RTAD would develop and resource a **road safety user behavior cell**, with staff to work on developing an understanding of road user behavior and to advise road safety partners on potential legislative and other policy measures to improve that behavior.

It is also recommended that an advisory group be established to meet with the working group two to three times a year to receive its inputs on current issues and to provide briefings on proposals being considered by the government (and their progress). The advisory group should include representatives of nongovernment organizations (NGOs); auto, truck, and bus industry associations; automobile clubs; and research institutes. The advisory group could meet annually with the combined working group and executive group.

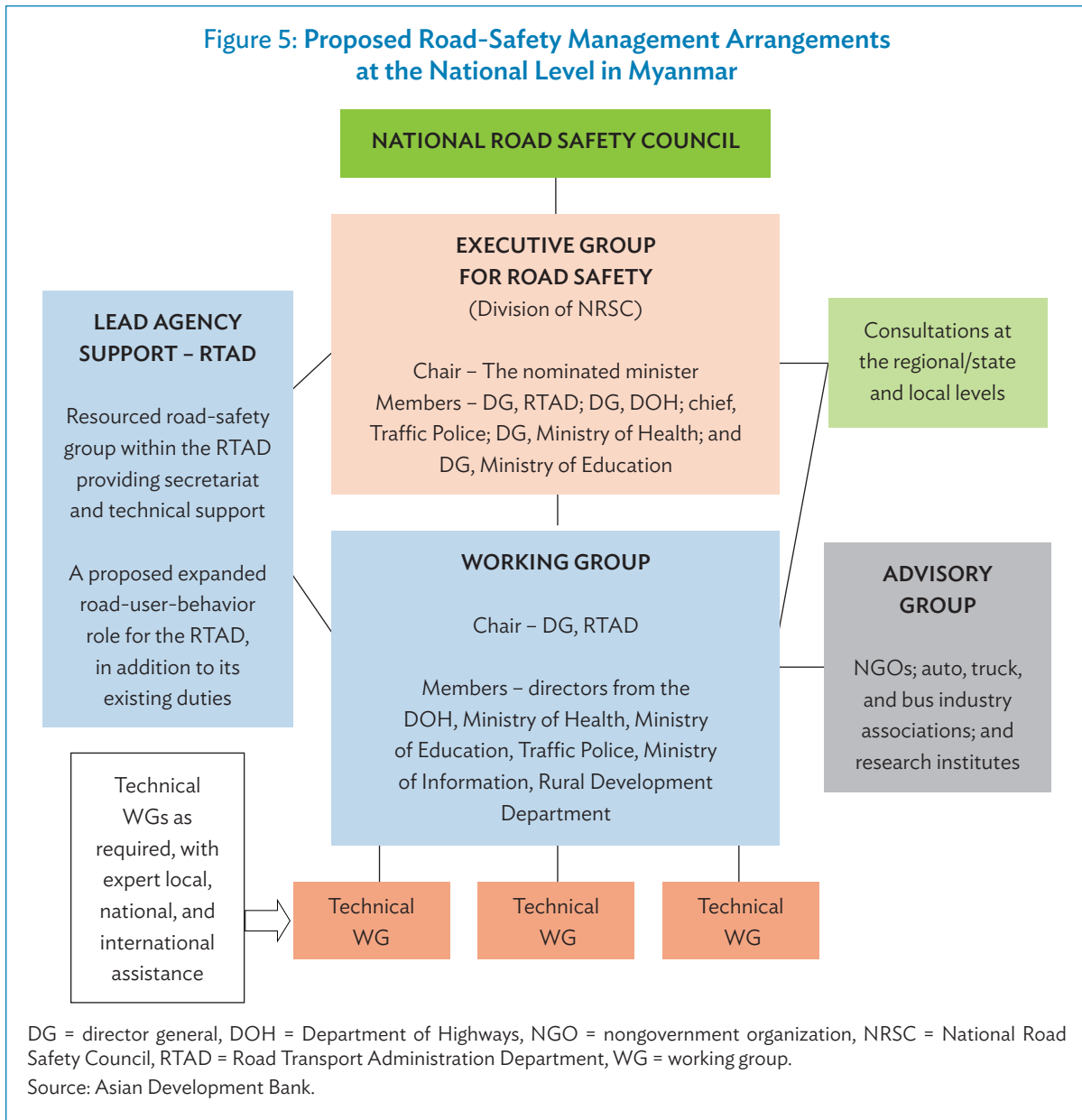
Liaising with regional/state and local governments would also be required on an ongoing basis—to gain ownership at those levels of proposed government policies and legislation, to encourage public information programs, and to enable the departments at the national level to become better informed on current local issues. These proposed arrangements are depicted in Figure 5.

Allocation of Actions under the Myanmar Road Safety Action Plan

There are 12 sectors for which actions are listed in the MRSAP. The following allocations are recommended:

- Sectors 1 (Coordination and Management), 11 (Road Safety Funding and the Role of Insurance), and 12 (Cooperation and Collaboration) should be allocated to the executive group and working group for action.
- Sectors 2 (Traffic Legislation) and 8 (Police and Law Enforcement) should be allocated to a technical working group to be set up from existing agency resources.
- Sector 3 (Vehicle Safety Standards) is the responsibility of the RTAD.
- Sector 4 (Driver Training and Testing) should be allocated to a technical working group.
- Sectors 5 (Safe Planning and Design of Roads) and 6 (Improvement of Hazardous Locations) should be allocated to a technical working group, probably one that is led by the Department of Highways (DOH).
- Sector 7 (Publicity, Campaigns, and Road Safety Education for Children) should be allocated to a technical working group.

Figure 5: Proposed Road-Safety Management Arrangements at the National Level in Myanmar

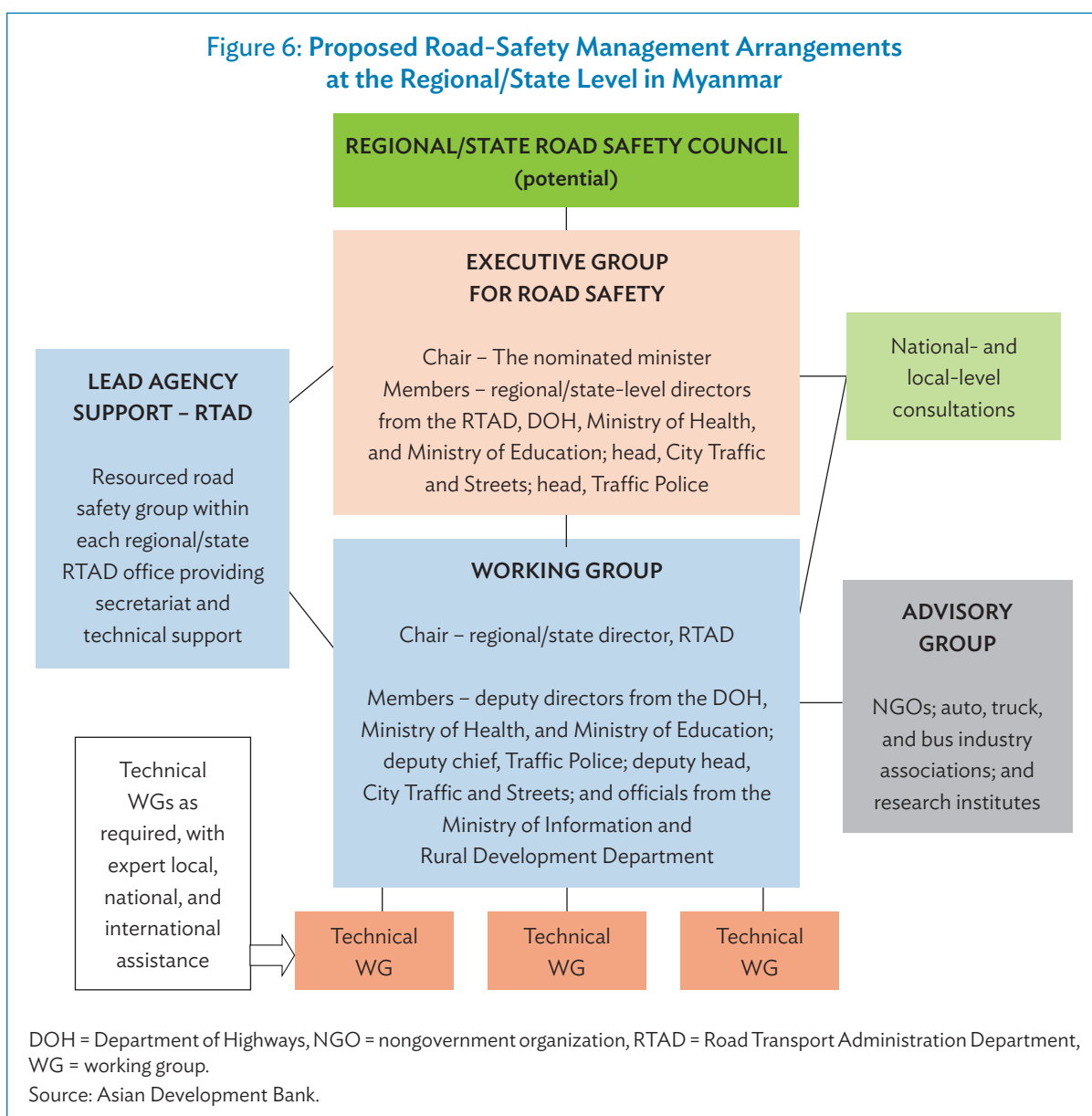


- Sector 9 (Accident Data System, Road Safety Research, and Road Accident Costing) should be allocated to a technical working group for early attention, considering that these actions have been identified as high-priority “enabling activities” in the demonstration-project “enabling systems” category, for early attention category.
- Sector 10 (Emergency Assistance to Road Accident Victims) should be allocated to a technical working group.

In summary, six technical working groups would be required at the national level.

Local-Level Coordination Structure

Similar arrangements to those proposed for the national level are recommended for regional/state level, with an appropriate chair and members to constitute (i) the regional/state executive group and (ii) the regional/state working group. These proposed arrangements are depicted in Figure 6. The groups at the regional/state level would be supported by the RTAD as the lead agency, with management, administrative, and coordination responsibilities. Technical working groups with supporting expertise would be established across the agencies for specific areas of activity. An advisory group would also be established in each region and state, and liaison mechanisms with local governments would also be important.



The role of the TRES Cs at the regional/state level within this new framework needs to be carefully considered. Their duties should continue at this stage; and their measures on the ground, as well as their policy, legislative, and infrastructure-related suggestions, should be reported to the proposed working group on a regular basis, and then, as appropriate to the executive group. In the medium term, some adjustments of the responsibilities could be agreed upon to take advantage of the new management arrangements.

These recommended arrangements would provide effective and workable decision-making and coordination structures for road safety at the national and regional/state levels.

4.3 Priority Interventions for Improved Performance

The prioritization of actions and planning of activities and schedules in detail will be essential. There is a practical limit as to what can be achieved. The MRSAP identified 101 actions to be implemented by 2020. Limited, if any, detailed activity planning and scheduling has been carried out for each action. When this is carried out, practitioners are often surprised at the amount of work required for implementation and the time frames involved. An example from a recent study in a middle-income country (Appendix C) shows the activities and scheduling associated with one action in that country's national road safety master plan.

Priority Road Safety Measures

In the short and medium terms, priority road safety measures should attempt to slow the significant annual growth in fatalities. Suggested priority actions are as follows:

Measures with Short-Term Impacts

- Substantially **increased police enforcement** of
 - helmet wearing,
 - correct behavior of drivers and riders at pedestrian crossings,
 - speed limits,
 - seat belt wearing, and
 - the licensing of drivers and riders.

Also,

- substantially **increased penalties for offences**;
- extensive **public advertising campaigns** supporting police enforcement efforts;
- **reviews of speed limits on unsafe lengths of road**, and reviews of speed limits where motorcyclists operate with other traffic (DOH and regional/state and local authorities);
- **the installation of crash barriers on approaches to bridges, as well as railings and/or parapets on bridges on higher-speed routes**, to protect motorists from hitting bridge end posts—a type of crash that involves violent force (DOH and regional/state and local authorities);
- **the introduction of extensive warning chevrons and signage** on curves, with the advisory travel speed indicated on a plate below the diamond-shaped curve sign, also guideposts and reflectors

- along rural highways, good-practice line marking at intersections, and traffic lights at higher-speed high-crash-risk intersections (DOH and regional/state and local authorities);
- **an upgrade of the safety standards of pedestrian crossings** on higher-speed roads with higher traffic and pedestrian volumes (see the demonstration project proposal in Section 5 for more specific intervention details regarding Yangon); and
 - **the installation of seat belts at the rear of all government vehicles, with the requirement that all government employees wear a safety belt** if it exists.

Measures with Medium-Term Impacts

- The creation of a **road accident database** and the carrying out of other enabling actions under Sector 9 (e.g., regarding research and the annual costs of crashes to Myanmar);
- the learning and acceptance of safe-system thinking by the DOH and other government agencies, and the introduction of **road safety audits** of new road projects (DOH and others);
- a **road network road-crash-risk assessment** implemented by the DOH to identify safety risks and prioritize improvement measures (possibly using the methods of the International Road Assessment Programme [iRAP]);⁶
- a black spot program launched by the DOH and other government road authorities to retrofit safety treatments to unsafe roads; and
- legislation requiring all new cars to have rear seat belts (RTAD).

Enabling Actions

- A linkage of the offence data system to the licensing system, and the development of a demerit point system; and
- a review and upgrade of the emergency-response and trauma-management systems.

Other Items to be Considered

- Higher-speed roads, especially higher-volume roads, are most likely to have more serious crashes (for vehicle occupants and motorcyclists).
- Vulnerable road-user crashes are most likely where motorcycles mix with other vehicles and pedestrians.
- The purpose is not to reduce crashes but to reduce the number of fatal and serious injury crash outcomes.
- Thinking based on shared responsibility is required.
- An administrative court system should be introduced to increase the capacity of the police for more widespread enforcement.
- There is a need to act urgently to prevent any underlying deterioration in respect for the law.

⁶ The International Road Assessment Programme (iRAP) is an organization accepted worldwide that analyzes crash risks along roads based on physical surveys and software analysis of that data. It also recommends interventions to reduce serious and fatal injury crash risks.

4.4 Suggested “Soft” Investments

Component 1: Leadership and Management

The creation of shared multi-sectoral leadership and management processes is the most vital activity to be addressed. There is a need for a designated agency to lead and coordinate the overall delivery of activities proposed under the project. The MRSAP identifies the RTAD as the agency assigned by the government to play a vital role in the newly formed NRSC in pursuit of improved road safety. It is also recommended that the RTAD be recognized as the lead road safety agency.

In addition to its functional road-safety responsibilities, the RTAD would have the responsibility of convening meetings of multi-sectoral groups within the decision-making arrangements, and would provide administrative and technical support to those groups.

It would be expected to lead the implementation of demonstration project activity at the national and regional/state levels. Current capacity is not adequate for this activity and considerable support, mentoring, and training would be necessary.

The RTAD should also establish a road-user-behavior safety cell at the national level to advise on measures to improve road user behavior, including the quality of driver and rider licensing. An outline of advice regarding the number of positions to be established and their respective roles is set out in Appendix B.

Component 2: Implementation of “Enabling” Actions

In many larger countries such as Myanmar, there are differences in the nature of the road safety efforts needed at the national level and at the regional/state level. Enabling matters such as data systems for crashes and licensing, penalties, and the fostering of university-based research capacity are often most effectively handled at national level. On the other hand, the delivery of road safety interventions is best carried out at the regional/state level. However, many of these interventions require the building blocks of good systems (enablers) to be in place.

Developing a Demerit Point System

Demerit point systems are used to strengthen deterrence efforts associated with enforcement (critical to improving a range of road user behaviors). Demerit points are effective in the deterrence of driver and rider illegality. However, demerit point systems require comprehensive national digital licensing records and comprehensive digital court and infringement records for traffic offences. Then the two systems need to be interfaced so that the driving records contain the up-to-date traffic infringement details, and the appropriate demerit points can then be allocated to the driver or rider.

Developing University-Based Road-Safety Research Capacity in Myanmar

Road safety progress in Myanmar will require a competent independent research facility to collect existing and additional crash-related data, conduct analysis of that data, propose policy improvements based on that analysis, and draw upon international evidence to identify further interventions that are likely to improve road-safety performance over time.

Enforcement of Road Traffic Law—Review of Penalties for Offences

Best practices in road-traffic-safety enforcement aims to control road user behavior through preventative, persuasive, and punitive measures designed to achieve the safe and efficient movement of traffic. This consists of legislation and related road-user penalties to govern the safe use of the traffic system, traffic policing aimed at deterring drivers from offending, courts systems that are supportive of the laws' being applied, and social marketing campaigns targeting key safety behaviors to promote road user compliance with safety standards and rules.

Several agencies pointed to the deficit in public compliance with key road safety rules and the need to update the penalty system. A review of national traffic-penalty policy in response to these pressures and to recent changes in Mandalay Region would be useful.

Strengthening the Road-Crash Data System

A comprehensive, workable system producing road-crash data that can be mapped to support network-wide risk identification is a fundamentally important enabling tool for road safety professionals, especially for understanding behavioral risk locations, infrastructure safety, and travel-speed risk locations. Evaluation is usually only possible with a reliable crash data system and associated crash mapping mechanisms.

Component 3: Policy Reviews

A demonstration project could contribute further to the improvement of Myanmar's road safety management capacity by benchmarking selected Myanmar policies and activities against international good practice, to take advantage of what has already been learned in order to be efficient and effective and, where appropriate, to adapt it to the local context. Four possible policy review options are identified below, from which one or two could be selected.

Driver and Rider Licensing Arrangements, Including License Testing

Driver safety standards are a major concern of the relevant government agencies, particularly when it comes to novice drivers and riders. The review could examine learner-licensed driver capability at the time of full licensing, as well as measures that could be introduced to deliver improved safety performance based on international good practice. The opportunities for prelicense testing, such as hazard perception testing, the consideration of the number of road hours of supervised experience, and improved on-road license testing, together with the possibility of graduated licensing steps in the future, are other measures that could be examined in a policy review.

Safe Heavy Vehicle Operation

Heavy commercial vehicle safety is another concern of the government agencies. The overloading of heavy trucks is proving to be a challenge, and freight growth is and will be substantial. In these circumstances, it is important to take a longer-term perspective and assess the options available to ensure that the regulation of the heavy vehicle industry is under control and in line with the safety and performance standards evident in good-practice countries. Government agencies also highlighted the need to regulate drivers' work hours to prevent cumulative driver fatigue, which has been found elsewhere to be a contributory factor in around 20% of heavy commercial vehicle crashes.

It is proposed that a systematic review of international good practice regarding heavy vehicle safety regulations be conducted, with a view to assessing the medium-term and longer-term policy options for Myanmar.

Crash Investigation Training for the Traffic Police

A strengthened and adequately resourced crash investigation squad within the Myanmar Traffic Police would deliver an improved understanding of crash causation among policy makers and analysts. Up-to-date equipment and software for crash reconstruction, plus intensive training over time to develop capabilities, are likely to change agency awareness of crash causation in Myanmar and to open the path to more effective interventions.

Development of a Manual on Safety Engineering and Associated Training for the Department of Highways

There are many visible deficiencies in infrastructure design and traffic operation, particularly the dangerous mixing of motorized and nonmotorized or slower traffic—and the lack of facilities to reduce these risks. It is proposed that a systematic review of existing approaches to the design, operation, and management of road infrastructure be undertaken, based on safe system principles, to assess the priority given to road user safety and measures to improve it. Special attention should be paid to the requirements for speed limits and safe road design, so as to enhance the safety of roads for vulnerable users, and to the related use of road safety auditing, road safety rating tools, and work-zone safety standards. While some use is made of road safety auditing, it should be extended to all new road designs.

Component 4: Building Road Safety Knowledge

Road safety knowledge requires urgent development within Myanmar’s government agencies at the national and regional/state levels.

A combination of measures will be needed, including ongoing and periodic technical assistance, externally provided training on specific issues, and study tours to other countries focusing on particular topics (such as crash data system improvements).

It will be necessary for the DOH to set up a road safety unit at the national level as soon as possible to commence its very substantial future journey. Police are also strongly advised to establish a strategic traffic safety unit at the national level to analyze data and provide strategic advice about trends and enforcement options.

4.5 Suggested “Hard” Investments

Several approaches are proposed, including the following

- A long-term “safer roads” program could provide a channel for budget and donor resources to target the most pressing infrastructure needs.
- Safety design should be mainstreamed into DOH investment and maintenance programs.
- Multi-sectoral demonstration projects involving all road safety stakeholders would provide an opportunity to pilot test new approaches to the safety of interurban highways, urban highways, and motorcyclists (three demonstration projects are proposed).

“Safer Roads” Investment Program

The poor condition of Myanmar’s highways, overall and specifically in terms of safety, means that large investments will be required to improve highways through a continuous program. It also means that the planned improvement of the highways through widening, rehabilitation, or periodic maintenance (most of the main highways and 25% of the trunk road network may be improved by 2020) will create both risks (as speeds will increase) and opportunities to improve safety while improving pavements.⁷

A dedicated program of targeted road safety improvements (a “safer roads” program) would be able to address the most severe safety risks. These could be identified through an iRAP crash risk assessment or an enhanced road crash database. The program could initially include: (i) black spot treatments, (ii) the installation of safety features on dangerous corridors, (iii) junction improvements, and (iv) the treatment of highways traversing built-up areas. This program would need dedicated funding (e.g., a budget line), clear operating procedures, and a central management team. It would initially be run by the DOH, in partnership with the RTAD.

In parallel, the DOH would need to integrate safety considerations and designs into its long-running investment programs. Safety designs and investments should become a normal activity, included in the budgets for road improvement, rehabilitation, and maintenance. Road works would be gradual, as the network is maintained or improved.

Demonstration Project 1: Multi-Sectoral Safety Interventions in a Targeted Interurban Highway Corridor

The objective of this component would be to develop multi-sectoral actions to improve the safety of all users of highway corridors in rural areas. The selection criteria for a potential targeted corridor would be as follows:

- The selected corridors should be higher-risk in terms of deaths and serious injuries.
- The corridors should be higher-volume, and thus have the potential to achieve significant results.
- The corridors should be located in a predominantly rural area that has some urban (village) sections, and should be about 50 kilometers (km) in length.
- The range of road safety problems and conditions should be representative of those that need to be addressed in Myanmar to reduce rural road deaths and injuries.
- The interventions should conform to good practice, with before-and-after measurements of their impacts. They should be replicable, allowing a subsequent rollout of effective interventions.
- The corridors should provide access to facilities that would assist multi-sectoral interventions (e.g., health and educational facilities).
- The corridors should have an iRAP assessment conducted along them as part of the demonstration project preparation and development.

Corridors that meet these general criteria need to be identified. Several potential options for multi-sectoral interventions in the demonstration corridors are specified below.

⁷ ADB. 2016. *Myanmar Transport Sector Policy Note: Trunk Roads*. Manila.

Safety Engineering

Most of the demonstration project costs should go for facilities and treatments targeting the safety problems of vulnerable road users, dangerous mixed uses in villages, roadside hazards, head-on crash amelioration measures, and treatments at road junctions. Possible treatments might include:

- intersection safety improvements (traffic signals, roundabouts, channelization, and delineation);
- improved pedestrian crossing treatments in built-up areas or where pedestrian flows are high, with raised pavement platforms, transverse rumble strips on approaches, advance warning signage, line marking, and street lighting;
- the provision of footpaths along narrow higher-risk sections of roads outside the major urban centers where pedestrian volumes are high;
- median treatments, or at least tactile center lines, to separate traffic, with refuges provided for crossing pedestrians;
- adequate curve designs for the proposed speed limit, guideposts with reflectors, curve warning chevrons, and advance curve warning signage with advisory travel speeds displayed;
- speed management treatments;
- the provision of hard shoulders and tactile edge lines, plus roadside barrier treatments for bridge approaches and places where roadside objects pose a high risk of serious, even fatal, crashes for vehicles leaving the carriageway;
- the widening of pavement edges where the existing width is inadequate;
- lower-speed zones near schools (20 km per hour) with associated road markings and signage;
- roadside amenities for road users, such as rest areas, truck lay-bys, etc.; and
- the provision of bus stops with safe areas for boarding and alighting.

Traffic Safety Enforcement and Social Marketing

Enhanced traffic enforcement activities can be designed and implemented in the demonstration corridors to develop more effective general deterrence-based measures for achieving improved compliance with vehicle and road user standards and rules. Such measures would include:

- speed management through appropriate devices, such as mobile speed cameras;
- adequate back office systems for processing of infringements, including the introduction of administrative court processes and resourcing to identify offenders and follow up on any delays in payment;
- occupant seat belts checking;
- motorcycle helmets checking;
- heavy vehicle safety regulations (especially regarding lighting, overloading, driver fatigue, and speeding);
- monitoring of driver and rider behavior at pedestrian crossings; and
- monitoring of overtaking practices.

This may present an opportunity to pilot a specially trained and equipped traffic patrol.

Local social marketing campaigns to improve traffic safety awareness and compliance with safety standards and rules, and warnings of heightened enforcement activities, need to be designed and implemented to support the enhanced traffic enforcement in the demonstration corridors. These campaigns would target all relevant parties and use all appropriate media, taking into account local literacy levels and language needs. The media

would include local television, radio, newspapers, billboards, and posters. There would also be opportunities to use local cultural events and outlets to disseminate key messages, and funding would be required to support related community development initiatives.

The safety of children crossing corridor roads near or on the way to school is a critical issue. School-focused measures would include speed tables at pedestrian crossings outside schools, with reduced-speed zones at these locations that would be well-signed and enforced. Short films would be produced to promote an understanding of road safety and convey key messages on the subject for students and, separately, for teachers.

Post-Crash Safety

It is proposed that enhanced post-crash safety services be designed and implemented in the demonstration corridor to improve the survival rate of road crash victims and their longer-term recovery prospects. These services are likely to include:

- first responder training programs for those, aside from local health workers, most likely to attend crash scenes (e.g., taxi drivers, local business people, and traffic police);
- emergency response systems to rapidly retrieve and convey victims to treatment centers;
- comprehensive trauma registries at hospitals; and
- investigations of road-traffic-injury monitoring systems at health facilities.

Road Safety Performance Measures

Category	Examples of Possible Measures
Risk exposure	- Traffic volumes by vehicle and road user type.
Final safety outcomes	- Deaths and injuries recorded by police. - Hospital data for road deaths and injuries recorded by health authorities.
Intermediate safety outcomes	- Average vehicle speeds by road type. - Front and back seat safety-belt-wearing rates for drivers and passengers. - Child seat-belt-wearing rates. - Motorcycle-helmet-wearing rates (driver and pillion). - Road infrastructure crash safety ratings (iRAP risk and protection scores). - Vehicle compliance with testing standards (roadworthiness). - Vehicle crash safety ratings. - Target audience recall and assessed relevance of publicity campaign messages. - Community attitudes to road safety. - Average response times of emergency medical services. - Rates of compliance (provided by the police) to various road rules (regarding alcohol, speed, unsafe overtaking, pedestrian crossing, and unsafe behaviors).
Intervention outputs	- Number of safety engineering treatments per section of road network. - Hours of police enforcement targeting high-risk behaviors. - Numbers of police infringement citations issued. - Media frequency and the reach of publicity campaigns supporting police enforcement. - Hours of school-based educational activities. - Number of driver training, testing, and licensing activities. - Number of vehicles tested. - Number of emergency medical service responses to road network crashes.

iRAP = International Road Assessment Programme.

Source: Asian Development Bank.

Monitoring and Evaluation

Systematic monitoring and evaluation procedures will need to be designed and developed to assess safety performance in the demonstration corridors. Performance measures should take the form of final outcomes, intermediate outcomes, and outputs, as presented in the examples in the table just above.

There would have to be reliable baseline estimates of current road safety performance in the demonstration corridors, and these would require the combining of available police and health-sector data. The project should pilot a new agreed-upon format for the site collection of crash data (crash forms) that would be more useful for interventions by a number of agencies and for the evaluation of enforcement effectiveness. This would require negotiations among the RTAD, the police, and the DOH.

Demonstration Project 2: Yangon Outer Urban Arterial Road Pedestrian Safety Improvements

The selection criteria arising from the review for the selection of a corridor or corridors in which to implement multi-sectoral interventions with a focus on pedestrian safety are as follows:

- The corridor should be higher-risk (in terms of deaths and serious injuries) and higher-volume, providing the potential for significant results.
- It would be an outer Yangon urban arterial road corridor that is at least about 5 km in length.
- The range of road safety problems and conditions experienced by pedestrians should be addressed on the outer urban arterial roads in Yangon in order to reduce deaths and injuries.
- The interventions should be effective and conform to best practice, with before-and-after measurements of their impacts; and they should be replicable, allowing a subsequent rollout of effective interventions for other roads.
- Each selected corridor should have an iRAP assessment conducted along it as part of the demonstration project preparation and development.

Police fatality data should be analyzed by the RTAD, the Yangon municipal government, and the police to identify a stretch (of about 5 km) on an outer Yangon arterial road that has a high density of fatal crashes involving pedestrians on an outer Yangon urban arterial road.

There should be an emphasis on pedestrian safety, including the following measures:

- a consideration of public transport safety, especially with regard to boarding and exiting buses;
- the provision of footpaths alongside roads;
- infrastructure safety treatments, including the installation of raised platforms and pedestrian-activated traffic lights at pedestrian crossings (every 500 meters);
- large and clearly visible advance signage, lighting and signage at crossings, traffic lights at intersections, and other associated traffic-management measures;
- a review of the appropriateness of speed limits, given the safety characteristics of the infrastructure and the mix of road users at different locations;
- the prevention of roadside markets operating on the major arterial roads;
- the prevention of the occupation of footpaths by traders, which forces pedestrians onto the roadways;
- the provision of bus bays for use by bus drivers when picking up or letting off passengers;

- the certainty that bus bays will be kept clear of traders and parked vehicles, so that they can be used for their intended purpose;
- the use of fencing to control access to buses at the bays, with gaps in the fences where the buses pick up and discharge passengers;
- the certainty that bus drivers will use the bus bays for picking up and letting off passengers; and
- a review of the laws regarding driver and rider responsibilities at crossings.

Demonstration Project 3: Mandalay Urban Motorcycle Safety Improvement

The criteria for the selection of an area in the city of Mandalay where multi-sectoral interventions would be implemented with a focus on motorcyclist safety are as follows:

- The urban area should be higher-risk (in terms of deaths and serious injuries) and higher-volume (in terms of motorcycles, other vehicles, and pedestrians), providing the potential for significant results to be achieved.
- The area should include at least one outer urban arterial road corridor, and the area for treatment should be at least about 4 square km.
- The range of road safety problems and conditions experienced by motorcyclists in the selected area should be addressed in Mandalay in order to reduce deaths and serious injuries.
- The interventions should conform to good practice, with before-and-after measurements of their impacts. They should be replicable, allowing a subsequent rollout of effective interventions in other areas of the city (and other cities), as appropriate.

Police fatality data should be analyzed by the RTAD, with the Mandalay municipal government and police to identify a higher-density area (of about 4 square km) known for its fatal and serious-injury motorcycle crashes.

Several potential options for multi-sectoral interventions in the targeted demonstration area in Mandalay are specified below. The emphasis is on motorcyclist safety:

- a separate slow lane or separate carriageway for motorcycles—and for vehicles entering or leaving properties;
- a policy on vehicle parking control;
- restrictions on the frequency of vehicle driveways from properties leading into the main carriageway (onto the slow lane);
- footpaths and crossings available for pedestrians;
- roundabouts with fully controlled left-turn phases provided at intersections and for U turns, plus traffic signals where roundabouts are not feasible;
- lower speed limits where motorcycles share the road with other traffic and with pedestrians (travel speeds should be from under 20 kilometers per hour [km/h] up to 30 km/h);
- lower speed limits where motorcyclists are mixed with other traffic, but where there are few pedestrians (with no separate right of way or separate lane), and travel speeds for all vehicles less than 40 km/h; and
- where there are no motorcyclists mixing with the other traffic and no pedestrian activity, travel speeds up to 60 km/h.

5 Next Steps

Key Suggestions

The recommendations in this report comprise a plan for short- to medium-term action. It is suggested that the government review them as a matter of urgency.

The government, therefore, needs to

- establish an executive group and working group to drive road safety management in Myanmar at the national and regional/state levels, starting with Yangon and Mandalay regions;
- select areas for demonstration projects;
- launch the development of key enabling systems and selected priority policy reviews;
- have the Road Transport Administration Department (RTAD) set up a road-user-behavior cell.
- have the Department of Highways (DOH) and the Traffic Police establish a road safety unit;
- implement priority short-term interventions;
- request donor funding through a grant and/or loan to support these actions and build the capacity of the DOH, Traffic Police, and the RTAD; and
- ask donors to finance safe-system-compliant roads only.

International financing institutions and donors could promote this safety agenda by

- financing demonstration projects and establishing enabling systems if the government requests it;
- funding training and the transfer of international knowledge, preferably on a long-term basis (up to 10 years);
- helping to raise decision makers' awareness of challenges and solutions;
- ensuring that the financed road projects are safe-system compliant; and
- providing technical assistance to facilitate the establishment of road-safety management capacity and institutions, and providing policy reviews and updates.

The Asian Development Bank (ADB) will provide technical assistance to advise and build capacity, and could consider financing a safety investment program.

This report has made an initial assessment of Myanmar's road safety situation, and offers proposals regarding government structures and priority actions. We suggest that the government review these proposals as a matter of urgency.

The following paragraphs summarize these proposals in the form of an action plan.

Improving Road Safety Management

- **Establish a functional executive group and working group to drive road safety management in Myanmar at the national level**, as outlined in section 4. The lead agency, the Road Transport Administration Department (RTAD), should provide the arrangements for support within the government. Also establish an advisory group at the national level. The executive group should report to the National Road Safety Council (NRSC).
- **Establish similar regional decision-making arrangements in the Mandalay and Yangon regions**, as outlined in section 4, involving city governments. Review those arrangements with a view to replication in other regions and states within 12 months. The role of the Traffic Rules Enforcement Supervisory Committees (TRES-Cs) needs to be determined. In the meantime, however, they should continue with their current work.
- An executive group at the regional level could report to a **Regional Road Safety Council**, if such councils are established, or alternatively to the NRSC.
- **The executive group and supporting working group, with the RTAD as the lead agency for road safety management, should be given the responsibility for overseeing and delivering demonstration projects that would include:**
 - **multi-sectoral treatments of corridors** or urban areas (i.e., rural road treatments at the national level, pedestrian safety treatments in a section of outer Yangon Region, and motorcycle safety treatments in Mandalay city);
 - **the implementation of key “enabling systems” and selected priority policy reviews** at the national level; and
 - **the development of road safety knowledge within the key Myanmar road safety agencies at the national and regional/state levels.** A mix of measures will be needed, including ongoing and periodic technical assistance, externally provided training focused on specific issues, and selected study tours to other countries focused on specific issues (such as crash-data system improvements).

The Department of Highways (DOH), Traffic Police, and the RTAD need to be priorities for rapid capacity development at the national and at regional/state levels for the following reasons:

- **The RTAD** needs training and guidance to develop its administrative and management support for the road safety management groups. It also needs to develop its road-user-behavior technical and policy expertise by establishing a specific cell of experts to advise on road user behavior policy and initiatives, including legislation, deterrence, campaigns, and driver and rider licensing. (See Appendix B for suggested roles.)
- **The Traffic Police** need as much support as possible in developing strategic and tactical enforcement techniques, advice on how technology can assist their efforts, and guidance on how the back office systems and court systems can be developed and freed up to process much more manual and electronic enforcement.
- **The DOH** (and other road authorities) need to recognize the major adjustments to traditional road design that the UN Global Plan expects and the safe system approach and principles require of them. They need to improve their performance in order to reduce fatalities on the roads, which are due to a noticeable absence of considered safety practices. Long-term intensive training and cultural change will be required.
- **The Traffic Police and the DOH need to establish road safety units** to further the development of knowledge and road-safety management capacity.

Priority Interventions

Suggested priority short-term and medium-term interventions were set out in section 4.3 of this report (page 23).

Potential Scope for Donor Involvement

The Asian Development Bank (ADB) will provide technical assistance for policy actions, enabling systems, the design of demonstration projects, and for the preparation of a safer roads investment program. It could consider providing loan financing to implement the demonstration projects and a “pilot” phase of the safer roads investment program.

There are many areas for potential donor support, as described below.

Road safety management support, including:

- **joint support with ADB for the soft and hard components described above, particularly the demonstration projects and the safer roads program;**
- **funding for training** the DOH, urban and local road authorities, the Traffic Police, the RTAD, and government specialists in urban development and rural development in safe-system technical capacities, safety guideline development, embedding safety practices in infrastructure design, and in the operation and maintenance of the road network, as all these skills will be critical through 2025 and beyond;
- **funding for training** ministers, senior management, and middle management in **safe-system awareness**; and
- **funding for training RTAD staff in establishing and making operational the lead agency’s management-support functions**, and then support for building the RTAD’s road-safety-management capacities.

Financing of safe system compliant roads—as much as is possible—for all donor-supported road infrastructure projects. This would entail

- investing in and requiring safe-system infrastructure and safe-system speed-limit identification (with a safe-system review to be adopted at the concept stage for any new road projects or retrofitted projects supported by donors, and suitable safe-system-treatment elements to be included as part of these projects); introduction of road-safety-audit training; and the development of knowledge of available tools for crash risk identification across the network, including the identification of treatment options for higher-crash-risk sections or intersections; and
- encouraging the government to start adopting these approaches for all road projects as soon as feasible.

Support for enhanced police training in speed management and in the enforcement of safe behaviors by drivers and riders at pedestrian crossings, safe overtaking behaviors, and helmet and seat belt wearing; plus factual briefings for judicial officers, and a review of how lesser offences are processed through the administrative court system.

Assisting the RTAD in establishing a road-user-behavior cell and mentoring the management support for their executive group and working group, followed later by support for the development of road safety research.

Support for an initial National Forum on Road Safety.

Workshop for Stakeholders

A draft of this report and recommendations on management arrangements, priority actions, and the potential for donor support were discussed at a workshop for key stakeholders, especially government agencies (at the national and regional/state levels), in Naypyidaw on 21 January 2015. Appendix C sets out notes from the workshop.

Key matters raised at the workshop included the addition of the Ministry of Information to the working group; the importance developing school and village road-safety education programs; the issue of parking policies in Yangon City; and the need for confirmed road-safety-funding arrangements, for speed guns (radar equipment) for the police, for public road safety awareness-raising measures, and for improved driver training. Also discussed were mass transit and school bus provision, support for road safety audits, assistance with the establishment of a road safety cell in the RTAD, the physical separation of motorcycle lanes from other vehicle lanes, access for the advisory group to the executive group, the need to encourage the privately owned media to take an interest in road safety, and the need for an annual National Forum on Road Safety.

APPENDIX A

Example of Planning Required for an Action to be Implemented

This appendix gives an example of what detailed planning for a single action under the National Road Safety Action Plan (NRSAP) could entail. This example is taken from an actual case in a middle-income country.

Pillar I: Action 7a—Safety Management System for Public Transport

Task

Implement a Safety Management System (SMS) in the public transport of both goods and passengers. Prepare selected passenger transport companies (that provide interprovincial passenger public transport and/or dangerous goods public transport) to implement an SMS and to conduct an assessment of the performance of the SMS. Also, monitor and evaluate the implementation of the SMS.

Scope

This action is the implementation of a Safety Management System by operator organizations, in this case public transport companies, for the public transport of both goods and passengers. It is proposed that this action be completed with two deliverables:

Deliverable 1: Preparation of a national pilot project for the implementation of an SMS. Selected public transport companies in several provinces would implement the SMS.

Deliverable 2: Preparation of assessors, with training of assessors and training of trainers (TOT), locally and overseas.

Discussion

The SMS has been developed, and it has been discussed with some companies and provincial transport officers. A number of private bus companies are already applying the SMS. The proposed method of implementation is a pilot project involving large bus companies in two provinces after the initial training of a small number of government staff has taken place and ministerial regulation has been established. This will be followed by more formal training for private sector advisers to enable them to guide companies in SMS and initiate a rollout to more provinces. The accreditation of assessors for monitoring the companies' performance will be required. Incentives and penalties to encourage companies to acquire and maintain their SMS accreditation will need to

be devised and agreed upon in a transparent manner. According to new government regulation, an SMS is one of the requirements for public transport companies before route licensing. Not all public transport companies are able to implement SMS, as some are hindered by their management conditions and limited resources. To overcome this problem, the government should support them with technical assistance.

Agency Capability for this Task, Areas for External Support

Providing national and provincial staff with a broader perspective on SMS would be achieved most effectively through a fact-finding mission and training in a high-income country, such as Australia. These tasks will require technical assistance, funding, and high-level official and political support.

Materials and training will be needed for the initial rollout of the SMS, and negotiations with transport companies, provincial governments, and the Ministry of Labor will be required.

Prioritized Work Plans

	2014			2015				2016				2017	
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Review current status of SMS package	■	■											
Have the lead agency convene meetings with provincial representatives to discuss rollout of project		■											
Develop plan for new government and ministerial regulations	■	■	■										
Draft new ministerial regulations		■	■										
Meet with proposed pilot-project provinces to discuss pilot details		■	■										
Have the ministry send a letter to provincial governments to inform them of the project and the need for their involvement			■	■									
Arrange overseas short-term training for some 30 provincial and central government senior staff on the SMS and related matters				■	■								
Develop SMS materials for provincial transport staff to give to bus companies, including simple “how to” guide			■	■	■	■							
Train Ministry of Transport and provincial staff to give pilot-project advice to company managers			■	■	■								
Identify first-stage SMS pilot-project locations with major bus companies in two provinces		■	■										
Progressively implement SMS pilot project in two provinces					■	■	■						
Evaluate pilot performance							■	■					
Adjust SMS details for further rollout									■				
Train Ministry of Transport staff to train private sector trainers to roll out SMS to more provinces						■	■						
Select proposed private sector trainers (TOT)					■	■							
Train selected private sector trainers (TOT)							■	■					
Have private sector TOT personnel commence guidance for rollout to further companies in more provinces (ongoing)									■	■	■	■	■

Table continued

	2014			2015				2016				2017	
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Establish accreditation arrangements for SMS auditors													
Provide accreditation training													
Appoint SMS auditors													
Conduct audits of companies operating an SMS													
Adjust regular license fee up or down, depending on quality of a company's SMS implementation													

Q1 (Q2, Q3, and Q4) = first quarter (second quarter, third quarter, and fourth quarter), SMS = Safety Management System, TOT = training of trainers.

Note: The dark blue squares indicate full-time; the light blue, part-time; and the white squares, no activity.

Source: Asian Development Bank.

Estimated Costs

Formulate regulations (ministerial regulations, administrative guidelines)	=	\$30,000
SMS pilot project implementation (four provinces)	=	\$100,000
TOT overseas training for 30 assessors (proposed grant)	=	\$200,000
Local training for provincial staff for pilot project	=	\$50,000
Total	=	\$380,000

Key performance indicators:

- The number of public transport companies adopting and implementing the SMS by 2019.
- A reduction in the number of victims in public transport accidents.

APPENDIX B

Proposed Road-User-Behavior Cell—Road Transport Administration Department

Position Roles and Duties

It is suggested that the road-user-behavior cell include five members in professional positions and two in administrative positions.

- **Road safety data analysts** would gather data; prepare statistics; carry out ongoing analyses of crashes, fatalities and injuries, and offences; and conduct regular surveys of agreed-upon intermediate outcomes (two positions initially).
- **The road safety economic analyst** would do an economic analysis of the costs of individual average fatal, serious-injury, and minor-injury crashes, and of the total costs due to crashes in Myanmar per year; the analyst would also prepare estimates of the costs of potential interventions and associated estimated serious crash-reduction benefits (one position).
- **Road safety behavior specialists** would guide licensing policies and penalties for offenses; research needs and findings to develop policies; monitor and review road-related rules, regulations, and legislation; and provide guidance and support to the police on enforcement to improve behavioral compliance regarding drunk driving, speeding, and helmet and seat-belt wearing (two positions).
- **The administrative staff** would consist of two administrative support positions.

Road Safety Data Analysts

The road safety data analysts would be required to

- gather data, prepare statistics, and conduct ongoing analyses of crashes and offences, as well as regular surveys of agreed-upon intermediate outcomes;
- provide technical support for the Road Transport Administration Department (RTAD) and for the government agencies' proposed working group and technical working groups;
- collect and analyze police data on crashes, injuries, fatalities, and offences, and distribute the results to the police and other agencies;
- identify fatality numbers and incidence by crash type and road user type, both in urban areas and rural areas, identify trends in these data, and record the fatalities according to the different speed limits in urban and rural areas;
- gain expertise in the development of proposals for policies and for interventions based on the crash data analysis of existing crash problems;
- observe agreed-upon intermediate outcome measures (e.g., mean speeds; helmet-wearing rates; seat-belt-wearing rates, front and rear; and emergency response times conveying the injured to hospitals) at, for instance, 10 locations in the network (including overall emergency response times for rural areas);

- monitor road safety performance and identify adverse trends that could affect future road safety outcomes;
- support the working group members' preparation of the annual report on road crashes in Myanmar;
- develop (in due course) expertise in the estimation of serious crash risks on sections of the network;
- identify information needs for road safety strategy development;
- identify the key elements of good-practice "results-focused," system-wide safety interventions using domestic and international research;
- prepare reports and information on road-safety trends and on current performance for distribution to agencies at the national and regional/state levels (and, in due course, at the local level) and to other stakeholders;
- establish contacts with regional/state level agencies to obtain data and information about road safety activities and outcomes;
- possess tertiary qualifications in science, mathematics, or statistics, with experience in government agency decision-making processes; and
- develop the ability to present data outcomes succinctly and clearly.

Road Safety Economic Analyst

The road safety economic analyst would be required to

- conduct economic analyses of the average per capita costs of fatal, serious-injury, and minor-injury crashes and of the total crash costs in Myanmar annually;
- prepare estimates of the costs of potential interventions (actions) by working closely with the key agencies and the working group and technical working groups;
- prepare estimates of the costs of associated serious-injury crash-reduction benefits that will be achieved through these interventions, based on research evidence of effectiveness, the incidence of the existing problem as shown in the crash data, and the costs of fatalities and serious injuries that could be avoided through the implementation of the potential action;
- advocate for measures that will offer priority benefits to senior management through the working group, and have a reasonable level of readiness for the implementation of those measures;
- work with the Traffic Police to identify and agree on further critical crash data to be collected, as this would strengthen the calculations of the potential benefits that could be achieved through specific treatments; and
- possess tertiary qualifications in economics or project financial management, as well as substantial public sector finance experience.

Road Safety Behavior Specialists

The road safety behavior specialists would be required to

- examine Myanmar crash data and research, as well as evidence from other countries, to determine the preferred basis for a policy of deterring unsafe and illegal behaviors by road users;
- develop a new licensing policy, especially for novice drivers and riders;
- review and develop strengthened policies for deterring drunk driving; increasing helmet wearing, speed limit compliance, and seat-belt wearing; reducing unsafe overtaking by all vehicles,

- especially buses; improving motorcycle rider safety; and improving pedestrian-crossing and roadside-walking safety;
- review the existing penalties for offences, and match the risk of various unsafe or illegal behaviors with the different levels of unsafe behavior within particular categories, and with the relative levels of penalties; also increase penalties, improve the certainty of adequate penalty application by the courts, and establish the certainty of follow-up, of penalty collection, and of an added penalty for delayed payment;
 - identify research needs, foster the development of a road-safety research capacity within the university sector, and support an initial annual program of road safety research in this sector;
 - monitor and review road rules, regulations, and legislation to improve the effectiveness of new or strengthened government policy directions;
 - provide ongoing guidance and support to the Traffic Police for specific enforcement approaches, so as to improve behavioral compliance by reducing the levels of drunk driving, speeding, failure to wear helmets and seat belts, and failure to give way to pedestrians at intersections or pedestrian crossings;
 - prepare briefing notes on relevant behavioral matters and potential solutions for executive management and/or for ministry-level or cabinet-level decision making, as requested;
 - prepare press releases on behavior-related issues for ministers and other government officials;
 - ideally, possess tertiary qualifications in psychology and experience working in government on behavioral issues; and
 - work with other agencies and convey research- and evidence-based advice in a way that will find acceptance.

Administrative Staff

The administrative staff would be required to carry out administrative duties in support of the positions described above. Other duties would include:

- early drafting of briefings for senior executives in the RTAD, for the road safety working group, the executive group for road safety at the National Road Safety Council (NRSC), and for government ministers, as required;
- early drafting of public information materials to improve public road-safety awareness and provide the basis for campaign development, with agreed “take-out” messages for the public, always timed to occur in conjunction with targeted enforcement;
- early drafting of press releases containing government announcements about road safety, with the messages always based on evidence and research;
- following up on requests from senior staff for reference materials, including electronic and hard-copy research sources; and
- possessing tertiary qualifications in a related discipline, which, after more experience and study, will eventually enable these employees to become senior road safety staff.

APPENDIX C

Comments Received during the Workshop

Departments/Organizations	Remarks
Myanmar Police Force	<ul style="list-style-type: none"> ➤ To disclose road safety information, one member from the Ministry of Information should be included in the working group at the National Road Safety Council (NRSC). ➤ Driver fatigue is one of the major causes of road crashes, especially on long-distance journeys. So, every highway vehicle must be operated by two drivers: a principal driver and reserve driver. ➤ Fences should be installed between sidewalks and roads to avoid illegal crossing and selling on the sidewalks. ➤ There should be billboards in black-spot areas to warn drivers about road crashes and to inform them about crashes that have happened in those areas. ➤ Overpasses should be established in the most crowded areas. ➤ Parking areas should be established in the city of Yangon. Advice from the Asian Development Bank (ADB) on this problem is requested. ➤ The privately owned media should be encouraged to cover road safety issues. ➤ Well-equipped driver training schools should be set up, with the assistance of ADB. ➤ The implementation of the Village Education Plan started in January 2015, and we would like to request ADB support in distributing motorcycle helmets and pamphlets. ➤ There should be a modernized and well-equipped driver testing ground. ➤ Traffic police should receive speedometer guns (manual and digital), so that they will be able to effectively control aggressive drivers.
Department of Information and Public Relations	No comments.
Department of Education Planning and Training	No comments.
Department of Basic Education	<ul style="list-style-type: none"> ➤ For the safety of young schoolchildren, the Department of Basic Education needs to conduct road-safety measures such as educational talks at primary schools more frequently. ➤ Traffic police should be assigned to schools during the times when the students flock to and from the schools.
Department of Health	Not applicable.
Department of Housing and Resettlement	<ul style="list-style-type: none"> ➤ We would like to add some measures to the <i>Review of Road Safety Conditions in Myanmar</i>, such as performing road-safety public awareness campaigns; setting up road-safety warning signs on intercity roads and highways; installing speedometers and surveillance cameras for speeding; upgrading the design of roads, especially along black-spot stretches; maintaining buffer areas along intercity roads and highways; and creating adequate parking areas.

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Departments/Organizations	Remarks
Department of Rural Development	No comments.
Transport Planning Department	No comments.
Public Works	No comments.
Naypyidaw City Development Committee	No comments.
Yangon City Development Committee	No comments.
Mandalay City Development Committee	No comments.
Highway Police	No comments.
Naypyidaw Traffic Police	<ul style="list-style-type: none"> ➤ To share road safety information, an official from the Ministry of Information should be included in working party of the NRSC. ➤ Driver fatigue is one of the major causes of road crashes, especially in long-distance journeys. So every highway vehicle must be operated by two drivers: a principal driver and reserve driver. ➤ Fences should be installed between sidewalks and roads to avoid illegal crossing and selling on sidewalks. ➤ There should be billboards in black-spot areas to warn drivers about road crashes and to inform them about crashes that have happened in those areas. ➤ Overpasses should be established in the most crowded areas. ➤ Motorization, including the increase of motorcycles imported from the People's Republic of China (PRC), increases the risk of accidents, especially during peak traffic hours. Motorcycle-specific lanes should be established. ➤ Closed-circuit cameras (video/photos) should be installed at traffic lights to effectively identify offending drivers. ➤ For emergency medical care, traffic police must have their own ambulances.
Yangon Traffic Police	<ul style="list-style-type: none"> ➤ At present, the number of vehicles in Myanmar is only 30% of that in the neighboring countries. But without any road safety efforts, fatalities could be expected to double by 2020 or 2025. ➤ Enforcement of road safety currently varies from one area to another. This should be reconsidered and negotiated. ➤ The responsibilities of the regional/state Traffic Rules Enforcement Supervisory Committees (TRES-Cs) should be expanded to help achieve the objectives of the NRSC. ➤ There should be more driver training schools, and only qualified drivers should be issued driver's licenses. ➤ In Yangon, there should be more parking areas, and the use of public transportation should be encouraged. ➤ Collaboration between concerned departments and organizations is important for collecting information, promoting enforcement, seeking funding, implementing road safety measures, and promoting road safety actions. ➤ To share road safety information, an official from the Ministry of Information should be included in working party of the NRSC. ➤ Closed-circuit cameras (video/photos) should be installed at traffic lights to effectively identify offending drivers. ➤ ADB's technical assistance is cordially invited. ➤ To meet the targets of the NRSC, fund-raising is essential.

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Departments/Organizations	Remarks
Mandalay Traffic Police	<ul style="list-style-type: none"> ➤ In Mandalay Region, rural areas account for 50.05% of total crashes (urban areas account for 49.95%), so we are developing a “Rural Education Plan.” To make this plan more effective, we would like to request that ADB distribute motorcycle helmets, pamphlets, road signs, and pamphlets on road markings to promote road safety awareness. ➤ There should be driver testing courses that have enough space to enable learners to practice their driving skills. These should be established through a collaboration between ADB and the Government of Myanmar. ➤ Speedometers with digital systems should be distributed to traffic police, with the assistance of ADB. ➤ Fences and lampposts should be installed along motorcycle lanes in Mandalay. ➤ A mass transit system and school bus system should be introduced.
All-Bus Line Control Committee, highway and intercity (Naypyidaw)	<ul style="list-style-type: none"> ➤ The main causes of road crashes are pedestrian offences and lack of knowledge regarding road safety. Control of pedestrian behaviors has to be achieved in various ways, such as police patrols, electronic devices, road signs, and road markings. The most important thing is pedestrian awareness. That is why there should continuous information campaigns for the people. ➤ In Myanmar, the majority of the professional drivers are uneducated. They were trained in a traditional manner (i.e., father-to-son, driver-to-conductor), rather than in any systematic way. But now the number of cars is rising day by day, so to produce well-disciplined and qualified drivers, the government should establish driver training schools and issue certifications for quality driver training programs.
Bus Line Control Committee (Yangon)	Not applicable.
Bus Line Control Committee (Mandalay)	No comments.
Professor U Thit Lwin, Yangon General Hospital	<ul style="list-style-type: none"> ➤ Regarding the proposed road-safety-management arrangements, we agree with the framework, within which we would like to suggest that the “advisory group” have direct access to the executive committee, rather than working through the steering committee. ➤ There should be a sustainable and effective budget for the NRSC. ➤ We should develop a network including the departments concerned, and also international organizations. ➤ We should call a meeting of the “National Forum on Road Safety” as soon as possible.
Road Transport Administration Department	<ul style="list-style-type: none"> ➤ Road traffic crashes in all the ASEAN countries should be included in the report. ➤ Road safety statistics (accidents, injuries, and deaths) in all the ASEAN countries should be included in the report. ➤ The report should include the death rates per 10,000 vehicles of all the ASEAN countries. ➤ The report should include the death rates per 100,000 population of all the ASEAN countries. ➤ There should be comparisons of road traffic volumes in all ASEAN countries in order to highlight the status of our situation. ➤ The functions of the road-user-behavior cell should be clearly set out. The concept is very strange to us, and that is why we want to know the details of its functions. ➤ For the time being, the RTAD performs road audits, but it does not do so effectively because of the lack of human resources, technical know-how, and financial support.

Source: The proceedings of a road safety workshop held in Naypyidaw on 21 January 2015, as part of the preparation of the *Transport Sector Policy Note*.

Myanmar Transport Sector Policy Note

Road Safety

Better transport is essential to Myanmar's development. After decades of underinvestment, Myanmar's transport infrastructure lags behind other regional countries. Sixty percent of trunk highways and most of the railways need maintenance or rehabilitation. River infrastructure does not exist, while 20 million people lack basic road access. Can the transport sector deliver upon the master plan's objectives? What is needed to improve the quality of the infrastructure and services for the industry? How can basic transport services be provided to all? How can Myanmar reduce the economic and social cost of transport? This report is an attempt to answer these questions.

About the Asian Development Bank

ADB's vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries reduce poverty and improve the quality of life of their people. Despite the region's many successes, it remains home to the majority of the world's poor. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.



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