



ADB-ASEAN Regional Road Safety Program

Country Report:

CR 1



**Road Safety in
Brunei
Darussalam**



Asian Development Bank–Association of Southeast Asian Nations Regional Road Safety Program

Country Report CR 1: Brunei Darussalam

Regional Project Team

C. Melhuish, Asian Development Bank project officer
A. Ross, road safety adviser and project leader
M. Goodge, road safety specialist

Brunei Darussalam In-country Team

Hjh Hartini Hj Md Yussof, Universiti Brunei Darussalam, for National Road Safety Council
Negara Brunei Darussalam
Suhaimi Hj Ali, Universiti Brunei Darussalam, for National Road Safety Council Negara Brunei
Darussalam
R. A. Bush, research leader, Universiti Brunei Darussalam
Z. Mohamed, Universiti Brunei Darussalam
Hazri Hj Kifli, Universiti Brunei Darussalam
Dk Hjh Norulazidah Pg Hj Omar Alli, Universiti Brunei Darussalam

ACKNOWLEDGMENTS

The support and collaboration of various government ministries and their departments is most gratefully acknowledged.

The Department of Land Transport, National Road Safety Council, and Royal Brunei Police supported the research through the provision of data from their records. The Ministry of Health, through RIPAS Hospital, provided access to records that helped in determining the extent of death and injury from road trauma. Other departments also provided information on their activities.

The support of the private sector—including the provision of information on road safety initiatives, particularly the initiative of motor traders and the General Insurance Association Brunei Darussalam—is also acknowledged.

ABBREVIATIONS

ASEAN Association of Southeast Asian Nations

NOTE

In this report, "\$" refers to US dollars.

CONTENTS

1	COUNTRY DESCRIPTION	1
1.1	Brunei Darussalam within the Association of Southeast Asian Nations Traffic Context	1
1.2	General Description of Brunei Darussalam	1
1.3	Land Transport	1
1.4	Effects of Road Accidents in Brunei Darussalam	2
2	ASSESSMENT OF ROAD SAFETY	4
2.1	How We Know about Road Safety	4
2.2	Problem of Underreporting	6
2.3	People, Economy, and Ownership of Vehicles	6
2.4	Unique Nature of Brunei Darussalam Vehicle Fleet	8
2.5	Road Accidents, Injuries, Serious Injuries, and Deaths	8
2.6	Most Common Types of Accidents	9
2.7	People Involved in Accidents	10
2.8	Where Accidents Occur	11
3	RESPONSIBILITIES AND ACTIONS IN ROAD SAFETY ACROSS ORGANIZATIONS	13
3.1	National Road Safety Council	13
3.2	Department of Land Transport	13
3.3	Public Works Department	14
3.4	Ministry of Education	14
3.5	Ministry of Health	14
3.6	Royal Brunei Police	15
3.7	Motor Traders Association, Brunei Insurance Association, and Other Nongovernment Organizations	15
3.8	Universiti Brunei Darussalam	15
3.9	Combined Action on Safety Promotion Campaigns	15
4	SUMMARY: REDUCING RISKS, INCREASING PROTECTION FOR ROAD USERS, AND PLANNING FOR THE FUTURE	16
5	RECOMMENDATIONS	18

1 COUNTRY DESCRIPTION

1.1 Brunei Darussalam within the Association of Southeast Asian Nations Traffic Context

Although data on accident rates, deaths, and injuries in Association of Southeast Asian Nations (ASEAN) countries were limited in the late 1990s, there was enough concern for the ASEAN transport ministers, including the minister for communications representing the Government of Brunei Darussalam, to call for action at the multilateral meeting in 1998. By 2001, the Asia Development Bank had joined with ASEAN to provide technical assistance. Key people from each relevant country were brought together into strategy workshops during 2003–2004. Following these initiatives, research teams in each country began to develop country situation reports based on available research in each country. In Brunei Darussalam this task was assigned to Universiti Brunei Darussalam in October 2004.

This country situation report for Brunei Darussalam is the outcome of this process. The report is based upon data made available to Universiti Brunei Darussalam by the Department of Land Transport, Royal Brunei Police, and several other government ministries and data collected from records at RIPAS hospital, which is the country's main hospital.

During the preparation of this report, the Government joined with other ASEAN governments to sign the Phnom Penh Declaration. The declaration commits each ASEAN member country, including Brunei Darussalam, to addressing the region's escalating number of road accidents and related trauma, which is a major problem.

To ensure that the country carefully plans its commitment to the declaration, the Government has adopted an action plan to address road accidents in the country through a wide range of targeted activities and national capacity building, including setting targets for reductions in deaths and injuries over the next 5 years.

"Get behind" the plan is the national road safety slogan, and the slogan is now increasingly adopted across many activities.

1.2 General Description of Brunei Darussalam

Brunei Darussalam is a small country (5,765 square kilometers) situated on the northwest of the island of Borneo in Southeast Asia. The population is 336,376 (July 2000 estimate). The state consists of four districts: Brunei-Muara (the capital district); Tutong and Belait (center of oil and gas exploitation, in the west of the country); and Temburong, the eastern district, which has large areas of virgin rainforest. The country's main source of national income is the export of oil, which has allowed its people to prosper for several decades.

1.3 Land Transport

The history of land transportation in Brunei Darussalam began with the construction of the footpath between the Residency and Brunei Town in Subok in 1907. At first, road development started slowly. It was not until 1914 that a 60-mile road was constructed to link the capital, Brunei Town, and Kuala Belait at the far western end of the country. In the late 1980s and through the 1990s a national highway system was built and is now almost complete. Traffic calming was also introduced on local roads. The effect was to draw faster traffic away from the *kampongs* (village), making traveling easier and local areas safer.

Road traffic regulations were first introduced in 1924, and vehicles were first registered in 1926. With the increasing number of vehicles registered and regulations being enacted, the Department of Land Transport was established on 1 January 1963 as a body looking after road transportation matters. The Brunei Darussalam National Road Safety Council was established on 17 November 1977 to enhance road safety standards and provide programs to improve the national level of traffic safety. Brunei Darussalam was one of the first countries in the region to take such an initiative.

Travel demand in Brunei Darussalam grows as the population increases and, correspondingly, vehicle numbers increase annually. Vehicle ownership in Brunei is estimated to be greater than 210,000, and about 160,000 of all vehicles on the roads in any year are registered. There is about one vehicle for every three people in the country. The high car ownership rate in Brunei Darussalam is encouraged by the need for vehicle ownership, as a part of social and economic life, and access to funds to purchase relatively cost-attractive cars, resulting from a low tax base and a strong public aspiration for private vehicle ownership. This means that there are few vulnerable road users and very limited mixed-traffic conditions, because most people travel by automobile.

There are approximately 2,153 kilometers of roads in the country. The best developed road network is in the Brunei-Muara district, where most people live. There is a coastal highway (the Sultan Haji Hassanal Bolkiah Highway) that runs from Muara to Jerudong and then on to Tutong and now on to Kuala Belait. This road network is the primary means of movement for people and services on land, and demand on road space increases annually. Careful planning,

design, and construction of the road network are among the top priorities of the Department of Land Transport and the Public Works Department to ensure safer, efficient, less congested, and good standard roads that are vital for the growth and development of the country.

As a result, Brunei Darussalam has a lower traffic injury and death rate than all other ASEAN countries, except Singapore. However, compared with other countries with predominantly modern car fleets and a well constructed road system, there is considerable room for improvement in reducing the death, injury, and accident rates.

1.4 Effects of Road Accidents in Brunei Darussalam

Every day, almost everyone in Brunei Darussalam travels by private car on the nation's roads (to deliver and pick up children from school, shop, visit a mosque, see relatives and friends, and travel to and from work). The social and economic life of the nation depends on its road system and access to private vehicles.

In the last 20 years vehicle ownership has risen to above 200,000 nationally, but death and injury rates have not risen at a corresponding rate. This is a remarkable achievement for the country.

However, traveling on roads in Brunei Darussalam can involve some serious risks. Almost all adults will be able to recall someone who has died or was seriously injured as a result of a vehicular accident. In the past 10 years, 1 in 700 people in the country has lost its life on the roads, and the effect of this on close family networks in Brunei Darussalam accounts for considerable personal tragedy and grief. One in every 50 people has been injured on the roads in the past 10 years, at considerable financial cost to families and government services. At least one of every 12 people has been in a vehicle accident in the

past 10 years. Road trauma affects everyone in the country, leaving some families in devastating situations, and this has a significant impact on the country's gross domestic product.

There are now some indications that this situation may worsen over the next 10 years, unless new and innovative initiatives are undertaken. This is because the volume of vehicles can be expected to rise, and with more vehicles on the roads, the risk of accidents increases. More than 95, 000 young people will reach driving age, while only about 36,000 older people are likely to cease driving in the coming decade. Moreover, with three of every five accidents involving people under the age of 30 (at present) and with the number of younger drivers dramatically increasing, the risks of accidents will be among this younger and less experienced group. The need to target safe driving initiatives at younger drivers through a new range of initiatives is evident.

2 ASSESSMENT OF ROAD SAFETY

2.1 How We Know about Road Safety

There are three broad sources of information about road safety in Brunei Darussalam: local public knowledge, official government statistics, and private sector data owned by insurance companies and vehicle dealerships.

Public Knowledge. In Brunei Darussalam there is public debate about safety on the roads. The local media carry regular commentary on the state of the road system, hazardous conditions, and public views about the need for improvements. There are regular letters to newspaper editor columns and features on country websites.

The Department of Land Transport and the National Road Safety Council regularly run forums about safety on roads and also make use of media outlets to warn about road-related death and injury rates and provide information related to reducing risks (e.g., informing the public of the requirement for children under the age of 12 to wear seat belts and publishing articles on defensive driving courses).

The people have many views about road conditions and safety and appear willing to express these. The general public, in some respects, includes knowledgeable users of the road system. High private car ownership rates and the use of a publicly developed and maintained road system encourage strong investment in dialogue with the Government. In local areas, for example, kampong leaders, among others, can point to specific hazards and potential ways to make improvements. This apparently strong interest in roads and automobiles at the local level can be used to build a road safety conscious nation through

partnerships with schools, businesses, and other organizations.

Government Statistics. Government ministries and their departments collect a considerable amount of data relevant to road safety. The increased coordination and collection of these data within the Department of Land Transport is a vital strength of the Brunei Darussalam road safety system. It enables timely monitoring of accident rate fluctuations and forms the basis for planning and public awareness information. With continuing quality refinements and standardization, it will provide the means to evaluate progress in risk reduction and prevention of road accidents and trauma through a multiorganization approach.

The main source of data on accidents is that provided by the Royal Brunei Police Force in the form of case records of individual investigations at accident sites and summary tables of data on some characteristics of accidents.

A road safety reporting system in the country can draw on four types of data: (i) data on the population, the economy, and social conditions over time; (ii) data on the vehicle and road environment over time; (iii) data from several sources used in an accident reporting system; and (iv) evaluation data that indicate the impacts of key road safety improvements, campaigns, and other initiatives in the wider community and the road environment.

Private Sector Data. The inclusion of insurance representatives and vehicle dealer representatives on the National Road Safety Council provides potential exchange of data on the economic costs of road accidents. The need for a well maintained database on accidents and costs is recognized by the General Insurance Association Brunei Darussalam, which is working to develop a sound data management system for the industry.

Table 1 provides a commentary of the available data system at present and its capacity, quality, and uses.

can be assessed. Improved computerization and data links will allow for improved data analysis.

Overall, the national capacity to collect data from several sources provides a very sound platform for continuous improvements. Broad trends in accidents

Table 1: Data Sources and Data Quality Assurance

Data Set	Availability and Uses	Quality Assurance
Population characteristics, the economy, and social conditions and/or aspirations	<p>Long-term data sets are available by years through the secondary analysis of economic data and population characteristics through census data and economic data sources. There are limited data on social aspirations and public views about road safety.</p> <p>The available data are adequate for contextual analysis and standardizing trends in road safety at the population level.</p>	Economic data tend to be subject to review and reports in standardized ways. Census data have limited reliability checks but appear reasonable when taken to determine trends over time.
Data on roads and vehicles	<p>Ad hoc data are available on road improvements.</p> <p>Systematic data from safety auditing by road safety engineers are not available, but some information is accessible.</p> <p>Number and type of vehicles are available, but data on the age of the national fleet are not easily accessible.</p>	<p>Not known.</p> <p>Not established.</p>
Data on road accidents and trauma	<p>Number, type, and general characteristics of accidents, injuries, and deaths are accessible through police records and collated throughout each year.</p> <p>The data are well used by authorities to inform the public in official campaigns and new media releases.</p>	<p>Strengths appear to be its quick and easy access to informed planning.</p> <p>Formal question and answer process is not available at present.</p>
Evaluation data on the impact of safety initiatives	<p>Broad indicators over time can be determined by comparing accident, death, and injury rates against population.</p> <p>Specific evaluations using models to assign causes and effects of specific initiatives are not generally available.</p>	Not available at present.

Source: Government data.

2.2 Problem of Underreporting

All countries have some level of underreporting of road accidents. This is mainly because, along with several others reasons, not all accidents are reported to police by those involved in accidents. By comparing hospital data on admitted cases from accidents with police data collected at accident sites, it is possible to estimate the level of underreporting. To determine the level of underreporting in Brunei Darussalam, all case records in 2003 and part of 2004 admitted through Accident and Emergency Unit at RIPAS hospital were identified in records, and these accident patient records were examined in detail.

The findings were compared with police records for the police districts served by the catchment area for RIPAS hospital. The transfer from outlying hospitals for serious cases was estimated at 25% of all such cases. The estimates were determined on 2003 primary data and then cross-checked using secondary data to create an estimated range of underreporting. The percentage of underreported deaths, injuries, and accidents are set out in Table 2.

The level of underreporting suggests that the seriousness of the road accident problem in Brunei Darussalam has higher social and economic costs than are usually reported.

Table 2: Estimates of Underreporting of Fatalities, Serious and Slight Injuries, and Accidents

(based on police and hospital records for 2003/04)

Area	Estimate Underreporting	Reasons
Fatalities	2–5% of deaths per annum	A small number of cases of seriously injured people who died in hospitals within 30 days of accidents
Serious Injuries (those resulting in overnight admittance to hospitals)	17–26% of serious injuries per annum	Some serious cases brought to hospitals by relatives, particularly from single vehicle accidents where police are not called
Slight Injuries (those resulting in hospital visits but not admittance to hospitals)	36–42% of slight injuries per annum	Walk-in cases from accidents not attended by police
Accidents	50–100% of all property damage only accidents per annum	Based on estimates from other accident studies in other countries (source of Asian Development Bank estimates)

Source: Government data.

2.3 People, Economy, and Ownership of Vehicles

The Brunei Darussalam population has grown by 40%, to approximately 360,000, in the past 20 years (Table 3). At present, about 50,000 are foreign

workers. As the population has increased, so has vehicle ownership, primarily among citizens and residents. At independence in 1984, there were 86,772 registered vehicles in the country. In 2004, there were more than 244,727 registered vehicles, an increase

of 65%. Over this period, vehicle ownership has increased at a faster rate than the population. Moreover, since 36% of the population is under the driving age, the vehicle ownership rate is one of the highest in the world. Vehicle ownership for the whole population is 680 vehicles per 1,000 people or just over one vehicle for every adult over 19 years of age in the country. The number of vehicles is

greater than the number of driver's licenses issued.

However, the figure for registrations is based upon accumulative annual registrations. The likely number of vehicles using the road system in the current year will be lower than this and is probably about 160,000.

Table 3: Population, Driver's Licenses, and Vehicle Registration Increases for Selected Years (1984–2004)

Year	Estimated Population	Driver License	Vehicle Registration
1984	215,900	—	86,772
1988	239,300	—	110,747
1993	276,300	78,740 ^a	160,400
1998	323,100	111,181	200,018
2004	358,000	140,000 ^a	244,727
	Population increased by 40%	Driver's license issuance increased by 43% over 10 years	Vehicle registration increased by 65%

^a Estimate.

Source: Brunei Darussalam data.

The national vehicle fleet is unique within Southeast Asia, with most of it being automobiles (privately owned and government owned).

Private car ownership is determined by three factors: (i) the need to have access to a private vehicle to participate in social and economic life; (ii) the access to funds, mainly in the form of financial loans to purchase cars; and (iii) the aspiration to own a modern vehicle.

It is necessary to have access to a private car to take part in social and economic life. Easy access to financial loans has made it possible for the majority to own a car. Access to loans in general has resulted in a national personal debt burden of greater than BND5 billion. As a result, some restrictions have been placed on financial loan access by the Ministry of Finance in 2005. Aspirations for car ownership have become possible not so

much because of the relatively high per capita income, which in official statistics has dropped over the past 10 years (2004 estimate is \$23,000 per capita), but because of access to finance. General personal loan debt repayments now account for just under 1% of the CPI.

Given the ongoing need to have access to a car and tighter financial constraints, it may be that the national car fleet will have an increasingly higher proportion of older vehicles, as the public balances car need with availability of finance. The net result in road safety terms may be more cars on the roads with lower roadworthiness.

The distribution of the population, with its large number of young people, has major consequences for the safety of the road environment. In the next 10 years, it is estimated that 95,900 young people will become eligible for driver's licenses,

while only 36,003 people will be 70 years of age and may therefore give up driving. This means that the road environment can expect to accommodate 59,898 new drivers. The impact of a much larger number of younger and inexperienced drivers on the roads should be a strategic target for road safety measures.

Further, this expected increase in the number of drivers should also increase the overall vehicle volume, and this alone will increase the risk of accidents, although not necessarily increases in deaths and serious injury since greater congestion results in slower speeds in built-up areas.

However, inexperienced driving on the network of modern highways in the country should increase risks on open

highways, since younger people tend to drive faster when given the opportunity, being less risk averse than older drivers in general.

2.4 Unique Nature of Brunei Darussalam Vehicle Fleet

Automobiles account for 92% of the national vehicle fleet, with the majority being privately owned. Only 3% of vehicles are motorcycles, and the number of heavy goods vehicles is less than 5%. In vehicle mix terms, the road system in Brunei Darussalam is remarkably safe. Most traveling is done in relatively modern cars with up-to-date safety designs on roads where there are very few vulnerable users (pedestrians, motorcyclists, and people on bicycles). Table 4 examines the vehicle fleet.

Table 4: Estimated Proportion of Types of Vehicles Registered for Road Use

(based on average registration 2002–2004)

Ranking	Type of Vehicle	Percentage
1	Cars (private and government owned)	92
2	Goods Vehicles and Buses	5
3	Motorcycles and Scooters	3
4	Other Vehicles	>1

Source: Government data.

Increased leisure time, a culture of sport, and rising awareness of the need to stay fit lead to a noticeable use of the road system for recreation, increasing the number of vulnerable road users in small numbers in some areas and at specific times of the day and week. Recreational cycling, motorcycle riding, and fitness walking are increasing in the country, and ensuring vulnerable user protection in the road system requires further investigation.

2.5 Road Accidents, Injuries, Serious Injuries, and Deaths

The number of road accidents reported by the Royal Brunei Police has fluctuated over the past 15 years but overall shows a decline. For the period 1988–1991 the average annual number of accidents reported was 2,892, whereas for the period 2000–2004 the average annual number of accidents was lower, at 2,657. Accident numbers will tend to vary annually for various reasons. To examine trends over time, blocks of 4 years were combined and averaged, and then the accident, fatality, and severe and slight injury rates per 100,000 people were calculated for these blocks

of times. This enables trends to take into account changes in the growth of the population over time and smooth out yearly fluctuations. The accident rate has declined from 1,171 per 100,000 people in the late 1980s to 742 per 100,000 people by 2004. Death rates have declined from 18.7 per 100,000 people for the period 1988–1991 to 8.1 per 100,000 people for the period 2000–2004.

However, severe and slight injury cases have increased for the same period. Severe injury rates have more than

doubled, from 8.3 per 100,000 for the period 1988–1991 to 17.4 per 100,000 in the 4 years prior to 2004. Slight injury rates dropped during the mid-1990s but have now risen to slightly more than they were 15 years ago. Currently, the average slight injury rate for the period 2000–2004 is 148 per 100,000 people. Accident, injury, and death rates are examined in Table 5.

Table 5: Accident, Slight and Severe Injury, and Death Rates per 100,000 People (1988–2004)

Years	Accident Rate	Slight Injury	Severe Injury	Deaths
1988–1991	1,174	147	8	19
1992–1995	1,180	126	16	21
1996–1999	876	140	18	17
2000–2004	742	148	17	8

Source: Government data.

These rates are based on accidents, fatalities, and severe and slight injuries reported to the Royal Brunei Police and will underrepresent the true rate because of underreporting (described earlier in this report).

The overall decline in fatalities but increase in severe and slight injuries is consistent with changes in the road and vehicle fleet safety designs that have occurred over the past 15 years. The separation of traffic on dual carriageways on the main national freeways and improvements in car safety features should have had an impact on death rates but not necessarily the accident rate, and Brunei Darussalam is consistent with this expectation.

2.6 Most Common Types of Accidents

Ninety-four percent of accidents involve automobiles. Fifty-three percent of accidents involve two or more automobiles, while 37% are single-automobile accidents and 5% involve accidents between automobiles and either a motorcycle, bicycle, pedestrian, or animal. Given the dominance of private automobiles on the roads and limited number of vulnerable road users, this is not surprising. However, the surprisingly high percentage of single vehicle accidents suggests some lack of appropriate defensive driving in hazardous conditions, given the reasonable road conditions. Accident types are examined in Table 6.

Table 6: Types of Accidents
(based on 2003 data)

Type of Accident	Number of Accidents	Percentage of All Reported Accidents (rounded)
Automobile and Automobile	1,199	53
Automobile and Motorcycle	17	1
Motorcycle (single)	16	1
Automobile and Bicycle	15	1
Automobile and Pedestrian	32	3
Automobile and Animal	36	3
Automobile (single)	827	37

Source: Department of Land Transport.

2.7 People Involved in Vehicle Accidents

Males are far more likely than females to be involved in vehicle accidents in Brunei Darussalam (79% to 21%), and this remains the case across all age groups. The rate of accident involvement is much higher among younger drivers than those below the driving age and those in their middle and later years of life.

For people between the ages of 19 and 24, the rate is 39 per 10,000. For people between the ages of 25 and 29, the rate remains high, at 36 per 10,000.

Thereafter, the rate drops to between 19 and 11 per 10,000 people. The rate for those under the age of 19 is 4 per 10,000.

The pattern described is typical of accident patterns in other countries, and because this rate is standardized and the age adjusted for the population, it is likely to be caused by a lack of driving experience, the tendency to take greater risks among males of a younger age, and perhaps a greater amount of time spent on the roads compared to older drivers. Table 7 examines population estimates.

Table 7: Population Estimates for Age Groups, Number of Accidents by Gender, Total Accidents, and Rate per 10,000 People
(based on 2003 data)

Age	Population Estimate	Males in Accidents	Females in Accidents	Total Number of Accidents	Rate (per 10,000 people)
Under 19	130,700	39	14	53	4
19–24	31,900	1,034	226	1,260	39
25–29	35,400	1,051	255	1,276	36
30–49	108,000	816	350	1,166	11
50–59	18,900	296	55	351	19
60 and older	15,100	163	12	175	11
		(3,399 total)	(912 total)	(4,311 total)	
		(79% of total)	(21% of total)		

Source: Department of Land Transport.

2.8 Where Accidents Occur

The majority of accidents occur in the more built-up areas in the Bandar-Muara and Berakas districts than in the other less populated districts of the country (86–14% in 2003). This is primarily because this is where the majority of the people live and where most of the driving is undertaken.

Of more significance in the Brunei Darussalam situation is where accidents are more likely to occur within the more built-up areas. Data collected on roads in the Bandar-Muara and Berakas police jurisdictions for 2001 and 2002 were made available and subsequently analyzed. The difference in accident numbers between the two years for all roads that accounted for more than 50% of the total number of accidents in the jurisdiction was less than 4%, indicating the pattern of accidents is likely to be relatively stable across the road system in the most populated area of Brunei Darussalam.

Higher risks of accidents occurred on the main arterial freeways, which are mainly dual carriageway with some sections of single carriageway. Almost half of all reported accidents occurred on the four main freeway systems of Barrackas (10%), Muara (11%), Muara-Tutong Highway (10%), and SHB Highway (8%). Six other roads account for between 6% and 2% of accidents, with the remainder of accidents occurring less than 2% on more minor local roads.

Caution should be exercised in considering the new highway system as

being a major contributing factor to road accidents because these roads carry a much greater volume of traffic. However, the new system, while splitting traffic into a safer dual system, has also provided the opportunity to drive faster.

Observation of police accident reports suggests that accidents are more likely to occur on freeways during wet conditions, although the proportion of accidents occurring under these conditions cannot be calculated from available data. High-risk roads are examined in Table 8.

Data that may assist in identifying specific high-risk road sites or black spots are limited at present. Examination of data for the Bandar-Muara District for a 6-month period in 2003 found there were no more than 7% of accidents reported in the same location during this period with the majority of sites spread more widely over the district. This suggests that while road improvements at black spots will reduce the risks of accidents, the overall impact of this strategy alone will be limited in terms of actual reported accident reductions. It seems that hazardous conditions and lack of defensive driving may be important risk factors in the Brunei Darussalam situation.

Table 8: High-Risk Roads within the Main Population Living Districts by Type of Road and Percentage of Overall Accidents (2001)

Name of Road or Highway	Type of Road	Total Accidents Recorded	Percentage of Total Accidents for Police Districts in Major Population Districts (Bandar-Muara and Berakas)
Muara	Dual and Single	61	11
Berakas	Dual	55	10
Murara-Tutong Highway	Dual	53	10
SHB Highway	Dual	46	8
Sungai Akar	Dual and Single	32	6
Berakas Link	Dual	22	4
Pasir Berakas	Single	19	4
Kebangsaan Lama	Single	17	3
RNPLambak (Jln 10 Selatan)	Dual	16	3
Mentiri Link	Dual	9	2
Kebangsaan	Dual and Single	7	1
Menteri Besar	Dual	7	1
	Dual = 7 roads Dual and single = 3 Single = 2		(63% of total accidents reported in police districts)

Source: Royal Brunei Police data.

3 RESPONSIBILITIES AND ACTIONS IN ROAD SAFETY ACROSS ORGANIZATIONS

One of the important long-standing achievements in Brunei Darussalam is the collaboration of a range of government and business organizations that have had the opportunity to work together through membership in the National Road Safety Council. On the other hand, one of the differences between Brunei Darussalam and some other countries is the lack of community organizations in the country, such as motorists associations, to represent ordinary road user interests in the planning of safer roads.

3.1 National Road Safety Council

Coordination of road safety has been the responsibility of the National Road Safety Council since its establishment in 1977. The council has high-level royal patronage and the permanent secretary of the Ministry of Communications as its chair. It meets three times a year, and its secretariat is within the Department of Land Transport. This arrangement enables the council to have access to information and data on changes in safety issues.

In recent years, the council has increased its collaborative partnerships with the private sector in safety promotion, education, and courses aimed at improving safer driving skills.

In the future, the council may wish to consider strengthening its strategic partnerships by linking the resources of these organizations to longer term programs that make use of multiple interventions specifically targeted at areas of risk, such as driving behavior and skills of younger drivers.

3.2 Department of Land Transport

While several government departments and the private sector contribute to safety, it is the Department of Land Transport that has a prominent leadership role in matters concerning drivers and vehicles on the roads, including safety awareness.

Among its functions and potential functions are oversight on quality upgrades of testing services, the linking of data from several sources on the state of road safety, standard setting, accreditation, and monitoring.

The department regulates learner driver education. A strong emphasis has more recently been placed on the role of driving schools in Brunei Darussalam. The purpose of this attention is to help ensure the quality of new drivers through a number of hours of driving practice and quality instruction.

Annual vehicle inspections are required for all vehicles that are 7 years old and older. There are testing centers in each of the four country districts.

One of the strengths evident in Brunei Darussalam is the collaboration between the Government and the private sector in road safety awareness and education. Regular partnerships and sponsorships occur between the National Road Safety Council, government departments, and industries (such as Shell Oil, Michelin Company, Persatuan Wanita Brunei, Hongkong Shanghai Bank Corporation, and Islamic Bank of Brunei).

For example, in 2005, awareness campaigns were conducted locally in each of the country's four districts to ensure the message about road safety being everybody's responsibility is visible everywhere.

In the future, the department may consider upgrading the quality of its data sources through better quality controls

and computer record links, so that the impact of interventions can be measured against changes in vehicle accidents in a responsive and timely manner.

A second important strategic function will be to consider the impact of current laws on road safety and where significant improvements may be made, particularly in speed limits and their enforcement in ways appropriate to the country's social and cultural way of life.

Recent advances in new regulations have included the use of mobile phones in vehicles, the codes for zebra crossings, and child seat belt legislation.

3.3 Public Works Department

The Public Works Department takes the lead in the planning and designing of the country's road system and traffic management. It also considers hazardous locations and targets these for safety improvements.

In the future improvements in the technical capacity of the department to achieve better road design safety through specialized traffic safety engineering and the use of verifiable scientifically based safety auditing will help in advancing the existing well developed road environment.

The department's collaboration with police and the Department of Land Transport in safety upgrading will be important to the quality assurance process and building confidence in the way engineering risks are being reduced.

3.4 Ministry of Education

Road safety education is a part of school civics programs. The National Road Safety Council and the Royal Brunei Police also conduct educational sessions. From time to time, curriculum material has been upgraded and assessed in terms of educational quality.

In the future, the ministry and its partners in safety education may wish to consider a stronger school community approach in which parents, teachers, and pupils work together to audit the safety of roads close to schools and take proactive steps to ensure safety as a whole-of-school issue. New approaches similar to this and more common information sessions will benefit from in-service teacher training and educational guides, so that the pool of knowledgeable educators extends from the current level to every school in the country.

3.5 Ministry of Health

In terms of road trauma, the ministry has two clear functions. First, the attendance and retrieval of those injured on roads and second the rehabilitation of the injured.

In Brunei Darussalam, there are different emergency numbers for different types of emergency services, and this may lead to delays to coordinating combined services at the scene of an accident. There is, however, a single ambulance number with coordination across the country.

At present, the ambulance services are primarily retrieval services with limited paramedic capacity to introduce stabilization of the patient at the accident site. Overall training in first aid across the various services and the public would lead to potentially reducing trauma complication.

Rehabilitation services form a part of the national health system in Brunei Darussalam and are free to all citizens, permanent residents, and expatriates working in the government service. Services are not free to others in the country, including expatriates working for private companies.

3.6 Royal Brunei Police

The Royal Brunei Police have a separate traffic department, with a presence at the police district level. It has designated traffic police vehicles and motorcycles with the capacity to provide 24-hour surveillance of traffic conditions.

The Royal Brunei Police work closely with the National Road Safety Council and the Department of Land Transport on safety issues.

It appears that there would be benefits from upgrading safety equipment for speed, seat belt, and phone use checking. Specialist traffic police training to reach international standards would be beneficial.

A key issue for traffic enforcement is achieving better driving at slower speeds on the major highways, especially during wet conditions, when the risk of accidents is at its highest.

3.7 Motor Traders Association, Brunei Insurance Association Brunei Darussalam, and Other Nongovernment Organizations

The private sector plays an increasingly important function in road safety in the country and works with the National Road Safety Council and other government bodies. Individual members of the Motor Traders Association have supported initiatives in driver training, for example. The General Insurance Association Brunei Darussalam has expressed a keen interest in efforts to reduce third-party insurance costs and has considered improvements to data collection to better monitor the situation. Other organizations, such as news organizations, actively support safety advertising as part of good corporate citizenship.

There is considerable strength in private sector commitment and collaboration, with every indication that this will grow

over the coming years. Shell Oil; Michelin Company; and banks, such as Hongkong Shanghai Bank Corporation, and Islamic Bank of Brunei, are among the leaders of partnership activities.

3.8 Universiti Brunei Darussalam

The university has a part to play in safety research through collaboration with various government departments and, especially, the Department of Land Transport.

It has recently demonstrated its capacity to undertake costing analysis through its young Brunei Darussalam staff and several other Bruneians are overseas gaining higher awards that will enhance a wider national capacity in research.

In the future, the university could build better links with other ASEAN researchers, especially in Malaysia, so that resources and knowledge are better shared.

3.9 Combined Action on Safety Promotion Campaigns

There is growing capacity to work across organizations on safety promotion campaigns in the country. For example, the introduction of child seat belt legislation in 2004 was soon after accompanied by wide publicity across many venues and involved poster and video productions.

In the future, these worthwhile and popular initiatives could be enhanced by linking campaigns to other coordinated activity, such as policing and vehicles checking. Most beneficial would be to shift up to campaigns that form part of longer term strategic targeting of at-risk situations, behaviors, and conditions in a more comprehensive way linked to researched best practices in risk reduction and competently evaluated.

4 SUMMARY: REDUCING RISKS, INCREASING PROTECTIVE FACTORS, AND PLANNING FOR THE FUTURE

While Brunei Darussalam appears to have better safety conditions than several other neighboring countries, it is worth recognizing that the death rate is about twice what could be achieved, given the comparatively good road conditions, the modern and safer car fleet, and fewer vulnerable road users. Moreover, it seems that the accident situation may worsen over the next 10 years because of the large number of inexperienced younger drivers entering the traffic system.

Brunei Darussalam has all the key foundations of a world-class road safety system and a long history of partnerships through the well established National Road Safety Council to achieve this end. Sound economic development and planning has produced a much safer system of roads and driving conditions than was the case 20 years ago. But, the main big ticket requirements have, it appears, now had their effects—better dual system highways, low numbers of vulnerable users, and a predominantly modern car fleet.

Achieving a reduction in death, serious and slight injury, and property damage rates will not occur without a new, innovative, and constant set of linked initiatives that involve the population at large. In general, Brunei Darussalam's initiatives are particularly strong in the educational field and much weaker in strategies that will change road behavior at the time of travel. Designing measures that will ensure defensive driving and lower speeds in wet

conditions on main highways will have a significant effect on reducing accidents and the social and economic costs of road trauma and property damage. Focusing on younger drivers through multiple strategies, linked and evaluated, may reduce the overall number of accidents as well.

It is possible to define what appear to be the key risks for accidents and what appear to be the key protective factors that help avoid accidents, injuries, and deaths in Table 9. In the future targeting initiatives that set out to effectively reduce risks and enhance protective factors using best evidence and local knowledge in consistent ways will have beneficial effects.

**Table 9: Key Risks and Protective Factors
in the Road and Traffic System**

Field	Risk Factor	Protective Factor
National partnerships, strategies, and planning	Tendency to organize one-off campaigns rather than longer term strategic linking of cross agency resources, including budgets, to multiinitiatives that are soundly evaluated for effects on accident outcomes	Well established history of coordination and consultation through the National Road Safety Council with public and private sector involvement
Data management	Limited quality assurance and ability to evaluate effects of specific safety initiatives	Good capacity to record long-term trends and make use of immediate changes in conditions in media campaigns directed toward the public
Road system	Limited use of best evidence approaches and advanced scientifically based safety auditing and advanced safety engineering	A well developed national highway system with local traffic calming and commitment to continuous engineering improvements at hazardous places
Safety promotion	Limited use of active local organizational participation in road safety while there is evidence of willingness of many to become involved Overdependence of government-led initiatives	Regular and well planned safety promotion campaigns with private and public sector involvement Increasing use of a wider range of initiatives such as defensive driving courses
Road users	Increasing use of roads for recreational purposes Apparent limited knowledge of traffic laws and compliance by some in some situations Limited systematic review to strengthen traffic laws and enforcement	Very few vulnerable road users Wide range of traffic laws that should enhance safety
Young drivers	Limited multisector strategic planning to address high-risk driving among male drivers.	Well established driving school and licensing system, although needing evaluation.
Road trauma	Limited availability of timely paramedic stabilization services at accident sites.	Sound and free national health system for citizens, permanent residents, and government-employed expatriates.

Source: Government data.

5 RECOMMENDATIONS

General rather than specific recommendations are made in this report. The country action plan will contain specific recommendations.

Given the nature of the road safety situation in Brunei Darussalam, it appears useful to suggest two types of approaches to building a safer road system. The first recognizes that while the country has made considerable advances, it now needs to step up to more advanced modern road safety systems if it is to address the much more difficult task of reduction in accidents, injuries, and deaths since the major big ticket approaches will have had their effects. There is a need to increase the multisector response through capacity building in equipment, training, and strategic planning.

The second broadly based approach concerns long-term targeting of risk situations, places, and drivers through the use of several different approaches on the same target (e.g., young people).

Capacity Building. Capacity building will involve

- (i) computer systems for record links and management of data about indicators of the road safety system;
 - (ii) quality assurance of data collection systems;
 - (iii) partnership approach across public and private sectors that moves beyond collaboration to strategic linking of resources and initiatives for the longer term;
 - (iv) ability to make use of scientifically based best evidence for effective road safety measures;
 - (v) advanced road safety engineering;
 - (vi) law enforcement through more and better equipment and training; and
 - (vii) access to paramedic services at serious accident sites.
- Targeting.** Attention will be focused on
- (i) drivers under the age of 25, particularly males, for education, skill development, licensing, law compliance, and defensive driving;
 - (ii) speed and hazardous driving in wet conditions, especially on highways;
 - (iii) identification of black spots for accidents and road improvements; and
 - (iv) review of traffic laws and compliance in the general population.