सत्यमेव जयते

বিশ্ব বাংলা

BISWA BANGLA

TRAINING MANUAL FOR DRIVERS

SAFE DRIVE
SAVE LIFE

Transport Department, Government of West Bengal

in collaboration with

Indian Institute of Technology Kharagpur

TRAINING MANUAL FOR DRIVERS

Edited & Compiled by

Bhargab Maitra, Ph.D.
Professor
Department of Civil Engineering
Indian Institute of Technology Kharagpur
Kharagpur – 721 302, India

Design & Printed by

Cygnus Advertising (India) Pvt. Ltd.
55B, Mirza Ghalib Street
Saberwal House, Kolkata - 700016
www.cygnusadvertising.in

© Indian Institute of Technology Kharagpur
Kharagpur, India - 721302
West Bengal, INDIA

Disclaimer

The information presented in the Book offers the views of the authors and not of the Book or its Editor or the Publisher. Publication does not constitute endorsement by the Book. No party involved in the preparation of material contained in the Book represents or warrants that the information contained herein is in every respect accurate or complete and they are not responsible for any errors or omissions or for the results obtained from the use of such material. Readers are encouraged to confirm the information contained herein with other sources.

TRAINING MANUAL FOR DRIVERS

A Publication by

Transport Department, Government of West Bengal

in Collaboration with

Indian Institute of Technology Kharagpur

মমতা ব্যানার্জী
ममता बैनर्जी
ممتا بنرجی
Mamata Banerjee

মুখ্যমন্ত্রী, পশ্চিমবঙ্গ
मुख्यमंत्री, पश्चिम बंगाल
وزیر اعلیٰ مغربی بنگال
CHIEF MINISTER, WEST BENGAL

2nd June, 2017

MESSAGE

I am happy to know that the Transport Department of the State Government is bringing out a **'TRAINING MANUAL FOR DRIVERS'** in collaboration with the Indian Institute of Technology, Kharagpur.

Our Government attaches the highest priority to road safety and has launched the **'Safe Drive Save Life'** campaign to generate awareness on various aspects of road travel.

I hope this Manual will help to achieve the objectives of the campaign in a more fruitful and holistic manner.

My best wishes to all those who are associated with this effort. I wish the publication all success.

(Mamata Banerjee)

Nabanna, West Bengal Secretariat, Howrah-711 102
West Bengal, India
Tel : + 91-33-22145555, + 91-33-22143101
Fax : + 91-33-22144046, + 91-33-22143528

Suvendu Adhikari
MINISTER-IN-CHARGE
TRANSPORT DEPARTMENT
GOVERNMENT OF WEST BENGAL
Paribahan Bhawan (1st Floor)
12, R.N.Mukherjee Road, Kolkata-1
Phone : (033) 2262-5402/2262-5403
Email : adhikarisuvenduwb@gmail.com

সত্যমেব জয়তে

শ্রী শুভেন্দু অধিকারী
ভারপ্রাপ্ত মন্ত্রী
পরিবহন বিভাগ, পশ্চিমবঙ্গ সরকার
পরিবহন ভবন (১ম তল),
১২, আর. এন. মুখার্জী রোড, কোলকাতা- ১
দূরভাষ : (০৩৩) ২২৬২-৫৪০২ /২২৬২-৫৪০৩
ই-মেল : adhikarisuvenduwb@gmail.com

PROLOGUE

Road accident is emerging as a burning issue to the society not only in the State of West Bengal but also globally at the national as well as international level. Every day, many innocent lives are lost due to the road accidents and in this context drivers have a significant role to play as many of these road accidents are caused due to the lack of awareness and faulty behaviour of some of the drivers. Hence, drivers who are aware and knowledgeable on the safe driving rules in order to avoid road accidents and to enhance road safety has become the need of the hour.

The Government of West Bengal is committed towards more road safety. The recent initiative put forward by **Mamata Banerjee,** Hon'ble Chief Minister West Bengal to increase public awareness through "Safe Drive Save Life" campaign with a goal to substantially decrease road accidents in the state of West Bengal has received widespread recognition to translate this version into reality. The Transport Department has taken up to bring out "Training Manual for Drivers" in close cooperation with Indian Institute of Technology, which will offer as a primary source of knowledge of safe driving rules and ethics to the drivers.

I express my sincere thanks to the Principal Secretary, Transport Department and his team for the initiative and for the active support without which the publication would not have been possible. I express my deep appreciation to Prof. Bhargab Maitra and his team of researchers from IIT Kharagpur for offering their technical knowledge and expertise in the domain of road safety to contribute to various chapters of the Manual. The training manual has covered the major aspects of road safety that everyone should be aware of as a driver and I encourage all the instructors, trainee drivers and other stakeholders to go through this Manual and play their part towards safe drive in order to a safe road environment. I am confident that this endeavour will help all concerned to have a new generation of safe, aware and ethical drivers who will be the frontrunners towards the 'Safe Drive Save Life' not only in the state of West Bengal but throughout India.

(Suvendu Adhikari)

15-3-2017.

Alapan Bandyopadhyay, I.A.S

Principal Secretary
Transport Department
Government of West Bengal
Paribahan Bhawan
12, R. N. Mukherjee Road, Kolkata-700 001
Ph. : 2262 5404 / 05, Fax : 2262 5406

Foreword

Road safety is a paramount concern today and Government of West Bengal has attached topmost priority to all the aspects concerning road safety. Enforcement, Engineering, Education, and Emergency Trauma care – these are the 4Es which stand as the cornerstones of the architecture of Road Safety Governance today.

Hon'ble Chief Minister of West Bengal has placed unprecedented amount of emphasis on building awareness about Road Safety as well as on taking several long-term institutional steps to ensure that all the cornerstones above are adequately nourished and nurtured in the interest of the people at large. Her campaign theme "Safe Drive, Save Life" has become a household phrase in West Bengal today.

One of the most important pillars in this architecture is proper training for drivers. Indeed, the drivers need the right kind of training and orientation to make the roads really safe. While the Acts and Rules make some provisions in this regard, there has been no well-documented training manual as yet for drivers. This is a knowledge gap with enormous practical implication. Driving is a science that requires comprehensive inculcation of right kind of information and skills. Public systems can ill afford to have any shortcoming in this sector.

Government of West Bengal has, therefore come out with a *Comprehensive Training manual for Drivers* now . IIT Kharagpur had been entrusted with this job and we particularly thank Prof. Dr. Bhargab Maitra , Professor, Department of Civil Engineering, Indian Institute of Technology , Kharagpur for ably leading the team that has compiled and edited this manual. Our officers have studied the draft, but the manual should not be treated as an authoritative treatise. Whenever there is any confusion or lack of clarity, the Motor Vehicles Act, 1988 should be referred to.

I particularly thank Shri Bhishmadeb Dasgupta, Special Secretary, Transport Department for executing this project. As a team, we have worked under the able guidance of Shri Suvendu Adhikari, Hon'ble Minister-in-Charge,Transport,West Bengal. We urge all the public officials (including police officials), Driving Training Schools and the drivers' community at large to consult this manual in the cause of road safety. Errors and omissions may kindly be brought to our notice.

Kolkata
31.01.2017

(Alapan Bandyopadhyay)
Principal Secretary

Surajit Kar Purkayastha, IPS
Director General and Inspector General of Police
West Bengal

Nabanna, 325, Sarat Chatterjee Road
P. O. - Shibpur Bazar, Mandirtala
Howrah- 711 102
Ph. : +91 33 2214-5400, 2479-4069
Fax : +91 33 2214-1139, 2479-4050
E-mail : dgpwestbengal@gmail.com

Foreward

Many tragic road accidents are occurring everyday in the State of West Bengal and all over India. In spite of the best efforts taken by the West Bengal Police to minimize the losses, road crashes are still being reported at various locations throughout the State. This is majorly because public knowledge of safe driving rules is inadequate and general awareness about the ethics of driving on road is substantially lacking. The "Safe Drive Save Life" campaign launched by the Honorable Chief Minister of West Bengal has successfully been able to gain recognition of the common people and bring about awareness about driving safely on the road.

To strengthen this initiative, the Transport Department in collaboration with Indian Institute of Technology, Kharagpur has come up with this "Training Manual for Drivers". The manual is a comprehensive source of knowledge of safe driving rules and regulations and I congratulate the team of Transport Department and IIT Kharagpur for their efforts in preparing this document with the potential for high societal impact. It is my sincere expectation that this manual will receive acceptance and recognition among general public.

11/4/17

DG & IG (Police)
Government of West Bengal

Rajeev Kumar, IPS

Commissioner of Police
Kolkata
18, Lalbazar Street
Kolkata-700001
Tel : 2214-5060 (O), Fax : 2214-5424

Foreword

Safety of road users is of paramount importance to Kolkata Traffic Police. Kolkata Traffic Police has been discharging their responsibilities of maintaining safe and efficient traffic operations in the metropolitan city of Kolkata as is the case with other traffic departments of other cities. However, the Police alone cannot ensure road safety and the road users also have a crucial role to play in this regard. Kolkata Police is indebted to the Government of West Bengal for taking the initiative to improve public awareness about safe driving. The support and appreciation of the general public is also evident by their active support of the "Safe Drive Save Life" campaign put forward by the Honourable Chief Minister of the state of West Bengal. Another keystone in this magnificent endeavour to educate the common people about the rules and ethics of safe driving is this "Training Manual for Drivers" prepared by the Transport Department in collaboration with Indian Institute of Technology Kharagpur.

As a driver, one must be aware of the rules and regulations of safe driving, the knowledge of which is somewhat lacking at present and this often leads to severe road accidents. I am really happy that the manual has all the necessary information to address the gaps in the drivers' knowledge and I am sure that it will make significant contributions to the welfare of the society. I congratulate the Transport Department and the expertise of IIT Kharagpur for dedicating their efforts to prepare this manual that has information on different traffic rules and regulations necessary for the drivers. It also guides the driver through different sticky situations that one may face while driving. I sincerely hope that this manual will receive all the appreciation it deserves and usher a very positive change among the drivers and road users to enhance safe traffic operations not only in the metro city of Kolkata or the state of West Bengal but all over India.

(Rajeev Kumar)

Preface

Road safety is a global concern and road accidents are one of the primary causes of unnatural deaths in India. With so many fatal road accidents occurring every day, safety on road has now become a social concern. Realising the deficiencies related to road safety, several initiatives are being taken in different facets, such as Engineering, Enforcement, Management, Public Awareness, etc. However, at the end of the day, drivers have a crucial role to play in maintaining safety on road as they are the end users of the road infrastructure. Hence, it is essential for the drivers to be well-educated, aware and disciplined in terms of driving a vehicle safely on the road and ensuring smooth traffic operations from their part. The motor training schools have a significant role to play in this regard because they are the key points of imparting the knowledge to the new drivers and aiding them to get a valid driving license with a thorough understanding of the rules, regulations and ethics of driving on the road. In recent times, when different motor training schools across the state of West Bengal were audited as a part of an initiative supported by the Transport Department, Government of West Bengal, it was observed that exhaustive and sufficient knowledge of the vehicle and functions of different vehicle parts as well as necessary driving skills were dedicatedly imparted by the trainers. But, only knowledge about vehicle and development of driving skills are not sufficient as the driver has to interact with different roadway features and other road users while driving. Some deficiencies were observed in terms of educating drivers about driving rules, regulations and safe driving tips. While development of driving skill is appreciated and drivers can develop their driving skills with time and experience, the knowledge of driving rules and regulations has to be imparted and, at present, the training remains incomplete as there is no standardised drivers' training material that is being offered at the motor training schools. This primary deficiency was also realised by the Government, and an urgent need was felt to come up with this "Training Manual for Drivers" to improve their basic knowledge of the rules and regulations of the road and drive with care and caution to enhance safety.

A team of researchers from Indian Institute of Technology Kharagpur contributed to coming up with ten specific chapters in this Manual which comprehensively covers all relevant areas of rules and regulations related to driving on the road with a focus on road safety. Different stringent safety rules and regulations are observed in many countries around the world and several codes of practice, legal rules, etc. have also been laid out in India. The authors have considered available literature, reviewed good and safe practices to develop this Manual with an attempt to explain the complex aspects of road

safety in a very simple manner through texts and pictorial representations. Chapter 1 introduces you to the different features of the road which you should be aware of as a driver. Chapter 2 and Chapter 3 include discussion on road signs and road markings which act as friends to guide, warn, and inform drivers, and help them to drive safely on roads. Chapter 4 guides you through the important rules for safe driving, and Chapter 5 informs you about safe driving tips in complex and sensitive environment. Chapter 6 makes you aware of the vulnerable road users and things you need to keep in mind to avoid an accident with or as a vulnerable road user. While driving, you need to be cautious and alert all the time without diverting your attention. This practice is extremely important as it helps you to keep away from any unsafe situations and hence, this aspect is discussed in detail in Chapter 7. As a driver, you should take necessary precautions to avoid a road accident, but it is important to know your duties and responsibilities if, unfortunately, you become associated with an accident. This aspect is discussed in Chapter 8. Chapter 9 aims to provide you with basic knowledge of first aid practices in the event of an injury related to road accident. Finally, Chapter 10 informs you about some legal aspects related to safe driving in India.

I am extremely happy with the initiative taken up by the Transport Department, Government of West Bengal for bringing out this Manual to educate the drivers and inculcate safe driving in the background of the on-going “Safe Drive Save Life” campaign. I gratefully acknowledge their support and cooperation for preparing this document. I am indebted to my Institute “IIT Kharagpur” for all encouragement and support to bring out this Manual as a humble contribution to the welfare of the society. I would like to express my heartfelt thanks to my colleagues and research scholars who have contributed to various chapters. It is my sincerest hope that the Manual will be useful not only for the trainers of motor training schools but also for the new generation of drivers. With this intention in mind, I encourage you as a driver, as a trainer, or even as a road user, to go through this Manual, share the knowledge with your peers, and work together to achieve significant societal benefits in terms of enhancing the road safety.

February 24, 2017

Bhargab Maitra

Editor

Necessary infrastructure & facilities in Motor Training Schools (MTS)

As per The Central Motor Vehicles Rules (CMVR) 1989, Rule 24

- A minimum of one motor vehicle each of the type in which instruction is imparted in the school
- A blackboard/marker board
- A road plan board with necessary model signals and charts
- Traffic signs chart
- Chart on automatic signals and signals given by traffic controllers where there are no automatic signals
- A service chart depicting a detailed view of all the components of a motor vehicle
- Engine gear box, brake shoe and drums (except where the applicant desires to impart instruction in the driving of motor cycles only)
- Puncture kit with tyre lever, wheel brace, jack and tyre pressure gauge
- Spanners (a set each of fix spanners, box spanners, pliers, screw drivers, screw spanners, and hammer)
- Driving instructions manual
- Benches and tables for trainees and work bench
- A collection of books on automobile mechanism, driving, road safety, traffic regulations, laws relating to motor vehicles and related subjects
- A fully equipped first-aid box for use in emergency at the premises

Other facilities

- Class room or Lecture hall with a seating capacity of minimum 10 persons
- Drinking water facility, washroom, and other basic amenities
- Video Projection facility
- A Desktop Computer to store all relevant information in digital format
- Biometric attendance facility

Books, Codes, and Guidelines

- CMVR, 1989
- IRC: 35- 2015 (Code of Practice for Road Marking)
- IRC: 67-2012 (Code of Practice for Road Signs)
- IRC:SP:55-2014 (Guidelines on Traffic Management in Work Zones)
- The West Bengal Motor Vehicles Rules, 1989
- Training Manual for Drivers

Authors

Annam Sai Kiran, *M. Tech.*	Research Scholar, RCG School of Infrastructure Design and Management, IIT Kharagpur
Arkopal Goswami, *Ph.D.*	Assistant Professor, RCG School of Infrastructure Design and Management, IIT Kharagpur
Bhargab Maitra, *Ph.D.*	Professor, Department of Civil Engineering, IIT Kharagpur
Dipanjan Mukherjee, *M. Tech.*	Research Scholar, Department of Civil Engineering, IIT Kharagpur
Dipanjan Nag, *M. Tech.*	Research Scholar, RCG School of Infrastructure Design and Management, IIT Kharagpur
Jahar Ranjan Sarkar, *BE.(Cal)M CIHTE. Cng. M. SoRSA (UK)*	Adjunct Professor, RCG School of Infrastructure Design and Management, IIT Kharagpur
Kinjal Bhattacharyya, *M. Tech.*	Research Scholar, Department of Civil Engineering, IIT Kharagpur
Kuldeep Kavta, *M. Tech.*	Research Scholar, RCG School of Infrastructure Design and Management, IIT Kharagpur
Munavar Fairooz C, *M. Tech.*	Research Scholar, Department of Civil Engineering, IIT Kharagpur
Nirmal Kumar Som, *M.B.B.S., M.D.*	Senior Medical Officer, B.C. Roy Technology Hospital, IIT Kharagpur
Prashant Prasad, *M. Tech.*	Research Scholar, RCG School of Infrastructure Design and Management, IIT Kharagpur
Reema Bera, *M. Tech.*	Research Scholar, Department of Civil Engineering, IIT Kharagpur
Shubhajit Sadhukhan, *M. Tech.*	Research Scholar, RCG School of Infrastructure Design and Management, IIT Kharagpur
Sudeshna Mitra, *Ph.D.*	Associate Professor, Department of Civil Engineering, IIT Kharagpur
Sudipa Chatterjee, *M. Tech.*	Research Scholar, Department of Civil Engineering, IIT Kharagpur
Swati Maitra, *Ph.D.*	Assistant Professor, RCG School of Infrastructure Design and Management, IIT Kharagpur
Uday Shankar, *LL.M, Ph.D.*	Assistant Professor, Rajiv Gandhi School of Intellectual Property Law, IIT Kharagpur

Table of Contents

Chapter	Page No.
1. Know Your Road	1
2. Road Signs	19
3. Road Markings	47
4. Rules For Safe Driving	69
5. Driving in Complex and Sensitive Environment	111
6. Vulnerable Road Users	133
7. Alertness and Attitude	145
8. Accidents and Emergencies	159
9. First Aid	175
10. Legal Aspects of Driving	185

List of Tables

Table		Page No.
Table 2.1	Colour pattern of direction information sign for different road types	23
Table 2.2	Mandatory/Regulatory signs and their descriptions	25
Table 2.3	Cautionary/Warning signs and their descriptions	30
Table 2.4	Informatory signs and their descriptions	36
Table 4.1	Common unsafe practices	106
Table 6.1	Common issues of vulnerable road users	136

List of Figures

Figure		Page No.
Figure 1.1:	Different categories of urban roads	2
Figure 1.2:	Different categories of non-urban roads	4
Figure 1.3:	Road surface and characteristics	6
Figure 1.4:	Typical cross section of a road	7
Figure 1.5:	A typical view of kerb	8
Figure 1.6:	Restricted sight distance on a horizontal curve	9
Figure 1.7:	Sight distance at intersection	10
Figure 1.8:	Superelevation on road	11
Figure 1.9:	Extra widening on road	11
Figure 1.10:	A typical view of summit curve	12
Figure 1.11:	A typical view of valley curve	12
Figure 1.12:	Conflicts at a four-legged intersection	13
Figure 1.13:	An example of traffic rotary	13
Figure 1.14:	An example of traffic island	14

Figure		Page No.
Figure 1.15:	An example of pedestrian underpass	14
Figure 1.16:	An example of vehicular underpass	15
Figure 1.17:	An example of overpass	15
Figure 2.1:	Classification of road signs	21
Figure 2.2:	Examples of mandatory/regulatory signs	22
Figure 2.3:	Examples of cautionary/warning signs	22
Figure 2.4:	Examples of informatory/guide signs	23
Figure 3.1:	Yellow and white coloured road markings	49
Figure 3.2:	Broken single centre line	50
Figure 3.3:	Solid single centre line	50
Figure 3.4:	Solid double centre line	50
Figure 3.5:	Combined centre lines	51
Figure 3.6:	Lane markings for four lane with solid double centre line	51
Figure 3.7:	Lane markings for four lane with broken single centre line	51
Figure 3.8:	Marking for no overtaking at vertical curve	52
Figure 3.9:	Marking for no overtaking at horizontal curve (double solid)	52
Figure 3.10:	Warning lines with hatched marking	53
Figure 3.11:	Bus lane markings	54
Figure 3.12:	Cycle lane markings	54
Figure 3.13:	Border or edge line markings	55
Figure 3.14:	Chevron/diagonal marking	55
Figure 3.15:	Stop line markings at intersection	56
Figure 3.16:	Give Way lines at intersection	57
Figure 3.17:	Urban intersection with pedestrian crossing	58
Figure 3.18:	Urban intersection with cycle crossing	58
Figure 3.19:	Speed change lane	59
Figure 3.20:	Directional arrows	59
Figure 3.21:	Box marking at intersection	60
Figure 3.22:	Obstruction approach marked with diagonal marking	60

Figure		Page No.

Figure 3.23:	Markings at railroad crossing	61
Figure 3.24:	Markings for angle parking	61
Figure 3.25:	Marking for perpendicular parking	62
Figure 3.26:	Marking for parallel parking	62
Figure 3.27:	Bus stop marking	62
Figure 3.28:	An example of 3D markings	63
Figure 3.29:	An example of cycle lane marking using green colour	63
Figure 3.30:	Example of warning vehicles to reduce speed using red colour marking	63
Figure 4.1:	Safe driving distance: 2-Second rule	71
Figure 4.2:	Blind spot around a vehicle	72
Figure 4.3:	An example of lane selection	73
Figure 4.4:	An example of changing lane without suitable gap	74
Figure 4.5:	Various steps of lane changing	75
Figure 4.6:	A typical view of slip lane	75
Figure 4.7:	Parking restrictions near bus stop	76
Figure 4.8:	Parking restrictions near intersection	77
Figure 4.9:	Parking restrictions near railway crossing	77
Figure 4.10:	Parking restrictions near driveway, fire hydrant, and sidewalk	78
Figure 4.11:	Examples of improper parking	79
Figure 4.12:	An example of parallel parking	80
Figure 4.13:	An example of double parking	80
Figure 4.14:	An example of angle parking	81
Figure 4.15:	Steps for overtaking	82
Figure 4.16:	Guidelines for turning left	84
Figure 4.17:	Guidelines for turning right	85
Figure 4.18:	Red light	86
Figure 4.19:	Amber light	86
Figure 4.20:	Green light	86

Figure		Page No.

Figure 4.21:	Do not cut the corner at intersection	87
Figure 4.22:	Unsafe manoeuvre at intersection	87
Figure 4.23:	No overtaking at intersection	88
Figure 4.24:	Right of way at intersection based on stop sign	89
Figure 4.25:	Right of way at intersection based on Give Way sign	89
Figure 4.26:	Safe practices for entry and exit at roundabout	90
Figure 4.27:	Giving priority to the vehicle already in the roundabout	91
Figure 4.28:	View of a railway crossing	91
Figure 4.29:	An example of no stopping zone	93
Figure 4.30:	Various types of hand signals	93
Figure 4.31:	A typical view of full beam light	94
Figure 4.32:	A typical view of low beam light	95
Figure 4.33:	A typical view of hazard blinkers	95
Figure 4.34:	A typical view of turning indicators	96
Figure 4.35:	A typical view of parking lights	97
Figure 4.36:	Example of riding on running board	98
Figure 4.37:	Examples of wrong practice at one-way road	99
Figure 4.38:	A bike rider with safety accessories	100
Figure 4.39:	Blind spots: potential hazard locations for bike riders	101
Figure 4.40:	Staggered formation of two wheelers	101
Figure 4.41:	Tools and equipments required for heavy vehicles	104
Figure 4.42:	Blind spots of heavy vehicle	105
Figure 5.1:	Overview of construction zone	112
Figure 5.2:	Different construction sites with delineators and diversion sign	113
Figure 5.3:	Construction site with no signs, delineations or warnings	114
Figure 5.4:	Construction site with proper warnings	115
Figure 5.5:	Construction site during rain	115
Figure 5.6:	Changing lanes at construction zone	115
Figure 5.7:	Avoid distractions	116
Figure 5.8:	Typical rear end collision at a construction zone	116

Figure		Page No.

Figure 5.9:	Common wiper blade problems	118
Figure 5.10:	An example of a new tire and worn off tire	119
Figure 5.11:	Good contact between tire and road surface	121
Figure 5.12:	Hydroplaning (no contact between tire and road surface)	121
Figure 5.13:	Thin oil film formed over road surface	122
Figure 5.14:	Fog lights, low beam and high beam	123
Figure 5.15:	Hazard lights/blinkers switch on dash board	124
Figure 5.16:	An example for easy turn on hill	126
Figure 5.17:	Typical blind turn on hill roads	126
Figure 5.18:	An example for acute turn but not a blind turn	126
Figure 5.19:	An example for acute, blind and steep turn	126
Figure 5.20:	Road sign to caution for rock fall area	127
Figure 5.21:	Hazard triangle placed at the breakdown location	128
Figure 5.22:	Road signs to caution regarding animal movement	129
Figure 5.23:	Road sign indicating horn prohibition	129
Figure 6.1:	Different types of vulnerable road user	136
Figure 6.2:	Pedestrians at zebra crossing	138
Figure 6.3:	Do not use your mobile phone while crossing the road	138
Figure 6.4:	Pedestrian on footpath	139
Figure 6.5:	Pedestrian facing oncoming traffic	139
Figure 6.6:	Pillion riders on road with and without helmet	139
Figure 6.7:	Bicyclist on footpath	140
Figure 6.8:	School children on road	141
Figure 7.1:	A context of anticipation	147
Figure 7.2:	Types of distraction	151
Figure 7.3:	Examples of common distractions	152
Figure 7.4:	Common aspects of road courtesy	153
Figure 7.5:	Example of road rage	155
Figure 8.1:	Things to do when involved in an accident	161
Figure 8.2:	Avoid obstructing the road	161

Figure		Page No.
Figure 8.3:	Responsibility of the first visitor	163
Figure 8.4:	An example of trained assistance	163
Figure 8.5:	A reflective safety vest	164
Figure 8.6:	Reflective road signs to give warning about disabled vehicle	164
Figure 8.7:	Pumping the brake pedal	165
Figure 8.8:	Using horn and/or flash lights	165
Figure 8.9:	Rear wheel puncture	165
Figure 8.10:	Car brought to a complete stop in case of stuck accelerator	166
Figure 8.11:	Car hit from the rear	167
Figure 8.12:	No gap between head-rest and head	167
Figure 8.13:	Car hit from the side	167
Figure 8.14:	Car hit from the front	168
Figure 8.15:	Fire due to short circuit	168
Figure 8.16:	Do not drive the car on the footpath	169
Figure 8.17:	Steering procedure to avoid obstacle	170
Figure 8.18:	Accelerating to avoid collision	170
Figure 8.19:	Skidding caused by overspeeding on curves	171
Figure 8.20:	Steps to avoid skidding of cars	172
Figure 9.1:	Contents of a first aid kit	176
Figure 9.2:	Management of bleeding	177
Figure 9.3:	Pressure points in a human body	178
Figure 9.4:	Steps of making a tourniquet	178
Figure 9.5:	The C-A-B process of CPR	181
Figure 9.6:	Different steps of CPR	182

CHAPTER 1

Know Your Road

Swati Maitra
&
Reema Bera

1.1 Introduction

Driving a vehicle safely on the road is a challenging task. When you drive your vehicle, you interact with different road elements and also with other road users. So, it is important for you to know the various road elements and their functions in order to drive safely and efficiently. The present Chapter aims to introduce several roadway elements and discusses their significance and functions. This knowledge will eventually help you to become a safe and responsible driver.

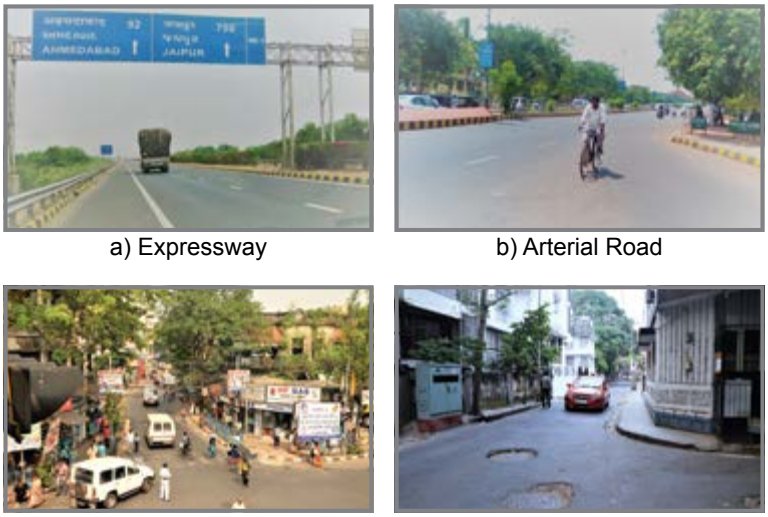
1.2 Classification of Road

Roads serve two functions namely, accessibility and mobility. “Accessibility” refers to the connectivity (i.e. connecting different places) while “Mobility” refers to the ease of movement (i.e. how fast you can travel from one place to another). It is important for you to know the classification of roads as different roads have different roles in terms of providing accessibility and mobility. Various classifications for urban and non-urban roads are discussed below.

1.2.1 Urban Roads

Urban roads (i.e. roads within an urban or city area) are classified as follows.

- Expressway
- Arterial Road
- Collector Road
- Local Street



a) Expressway b) Arterial Road

c) Collector Road d) Local Street

Figure 1.1 Different categories of urban roads

Expressways are the highest category of the road where vehicles are expected to travel at high speed (Figure 1.1a). The mobility has the highest importance for these roads and therefore, such roads generally do not have any at-grade junctions (i.e. two roads crossing at the same level). Grade separated facilities such as Flyovers, Interchanges, Underpasses, etc. are expected on Expressways in place of crossings with other roads. These are high-speed facilities, but as a driver, you must respect the speed limit and other restrictions to ensure safety.

Arterial streets are the next level of major roads in an urban area (Figure 1.1b). Here the mobility function is lower than expressway and therefore, speed is also lower. You should carefully note the speed restriction and other regulations on such roads and drive safely as per the function of the road.

Collector roads connect residential areas with the arterial streets (Figure 1.1c). The speed on these roads is lower than that on arterial streets. Roadside activities and disturbances are also higher on such roads. Hence, you need to be extra careful as a driver to avoid conflicts with pedestrians and other road users. Even in the absence of a posted speed limit, you should drive slowly on such facilities as accessibility has higher importance than mobility on such roads.

Local streets mainly provide accessibility to residential areas (Figure 1.1d). These are typically residential streets, and the primary function is to provide access to local neighbourhoods. So, the speed of vehicles must be low, and you must drive slowly and safely giving due priorities to pedestrians, cyclists, etc.

Altogether, you should keep in mind that all roads in urban areas are not for travelling at high speed. You must respect the posted speed limit in all cases. Even in the absence of posted speed limit, it is your duty to assess the function of the road and select a speed which is compatible with the roadway function.

1.2.2 Non-urban Roads

Non-urban roads (i.e. roads outside urban or city areas) are classified as follows based on their accessibility and mobility functions.

- National Highways (NH) and State Highways (SH)
- Major District Roads (MDR) and Other District Roads (ODR)
- Village Roads (VR)

National Highways (NH) and State Highways (SH) are primarily aimed to provide high mobility and accordingly, the speed is expected to be higher on such facilities

than on other categories of non-urban road (Figure 1.2a). However, you must respect the posted speed limit and other regulations on these roads to drive safely. Also, several stretches of NH and SH are passing through semi-urban areas where roadside activities as well as pedestrians and other non-motorized traffic are substantial. Even in the absence of posted speed limit, it is your duty to reduce speed at all such locations, remain alert, and drive cautiously and safely.

Major District Roads (MDR) and Other District Roads (ODR) are the roads within a district which connect district headquarters to other important places and also provide connectivity to NH and SH (Figure 1.2b). The mobility or speed on these roads is lower than NH/SH. Also, nearly all the MDR and ODR are undivided roads with two-way traffic movements. At several locations on MDR and ODR, you may find sharp curves, and interactions with pedestrian and slow moving vehicles. So, you need to be careful while driving on such roads and should not drive at high speed even though the traffic volume is generally low on such roads.

Village roads connect a group of villages with each other and to the nearest roads of higher mobility i.e. MDR or ODR (Figure 1.2c).These roads predominantly serve the accessibility function, and the mobility or speed is the least important on such roads. These are often narrow roads, have sharp curves and are used heavily by pedestrians, cyclists and slow moving vehicles. You must drive slowly on these roads to ensure safety for you and other road users.

Altogether, even for non-urban roads, the speed should be selected based not only on the number of vehicles or level of congestion but also on accessibility and mobility functions (or functional classification) of the road.

a) National Highway

b) Major District Road

c) Village Road

Figure 1.2 Different categories of non-urban roads

1.3 Surface Type and Characteristics

Surface characteristics of roads play an important role in providing a safe and comfortable journey for the road users. For instance, an uneven road causes discomfort while driving whereas a smooth road helps you to experience a comfortable driving. Similarly, there are various other aspects of road surface such as friction, light reflection characteristics, and drainage, which are important in the context of safe and comfortable driving. Figure 1.3 aims to show you various road surfaces and their characteristics. Following sections provide discussions on road surface characteristics.

Friction

Friction between the wheels and the road surface is a crucial factor for safe driving on roads. Inadequate friction on roads may cause difficulty in stopping of the vehicle after application of brakes. Hence, adequate friction between the wheels and the road surface is essential for safe driving. As a driver, you should be able to assess the friction and select the speed accordingly. For example, the friction on the road is generally reduced after the first rainfall of the season. Under such conditions, vehicles with worn out or old tyres will require more distance to stop. Figure 1.3a is an example of a road surface with adequate friction.

Light reflection

Light reflection characteristics of roads play an important role for visibility of roads at night. Visibility of concrete roads is better during night time as they have good light reflection characteristics, whereas bituminous roads have a poor reflection of light. As a driver, you should know that light reflection characteristic is not same for all roads. Therefore, you should be careful about the visibility and select a speed which is safe for driving during night time. Figure 1.3b shows light reflection from a road at night.

Drainage

A road with proper drainage facility helps to remove the excess water from the road surface thus ensures safe and comfortable driving. A good drainage facility helps to remove water during heavy rainfall or from an adjacent leakage in water pipeline. On many roads, the drainage facility is not adequate which leads to waterlogging, especially in urban areas. Also, there may be unevenness or crevasses on the road surface, which may not be visible during waterlogging. You should drive slowly and carefully while crossing waterlogged areas to ensure

your safety and the safety of other road users. Figure 1.3c shows waterlogging on roads which impair the visibility towards pavement surface.

(a) Road surface with adequate friction

(b) Light reflection from road surface at night

(c) Waterlogging on roads with limited road surface visibility

Figure1.3 Road surface and characteristics

1.4 Road Geometrics

While driving on road, you interact not only with other road users but also with several geometric elements of the road. Hence, to drive safely and efficiently, you should know the various geometric elements and their functions. The geometric elements include the following:

- Cross section elements
- Sight distance
- Horizontal alignment
- Vertical alignment
- Intersection

The following sections include discussions on the various road geometric elements and their functions in the context of safe driving.

1.4.1 Cross Section Elements

Cross section elements of road include carriageway, shoulder, median, lateral clearance, vertical clearance, kerb, and guard rail which are discussed in the following subsections.

Carriageway

It is the width of a road, which is used for movement of vehicular traffic. In general, you are not supposed to stop your vehicle on the carriageway because it will

interrupt the traffic flow and lead to congestion. Stopping on carriageway is also unsafe.

Shoulder

The shoulder is the width of a road adjacent to the main carriageway. It is provided to facilitate emergency stopping of a vehicle. In the event of an emergency or breakdown, you should pull your vehicle to the shoulder without blocking the main carriageway. On some roads, the shoulder is paved (as shown in Figure 1.4) and demarcated by a solid white line between the shoulder and the carriageway. On many other roads, the shoulder is unpaved. You should carefully assess the condition of unpaved shoulder before parking your vehicle.

Median

The median is the longitudinal space provided to separate the traffic streams moving in opposite directions. It is also used to install lights and traffic signs. Small bushes are often planted on the median to avoid the glare of lights from the traffic coming from opposite direction. As a driver, it is important for you to note the following:

- Often medians are separated from carriageway using raised kerb (a kind of physical barrier). So, while using the innermost lane (adjacent to median), you should be extra careful not to lose control of the vehicle. An uncontrolled vehicle may hit the median and cause an accident.
- You must respect the direction of travel and must not travel in the wrong direction causing contraflow. Always drive keeping the median on your right side. You should not hesitate to travel additional distance (in lieu of causing contraflow) for the sake of your safety and safety of other road users.

From Figure1.4, you can clearly comprehend shoulder, carriageway and median on a typical road section.

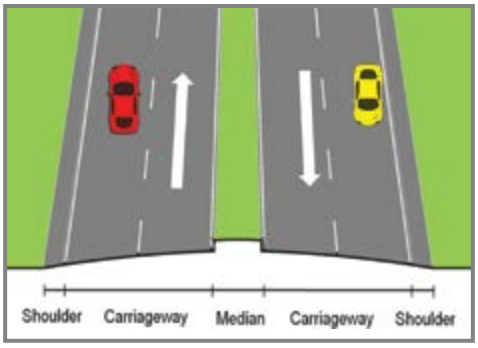


Figure1.4 Typical cross section of a road

Lateral Clearance

Lateral clearance is the distance between the extreme edge of the carriageway and the nearest face of the obstruction. Hence, while driving on the extreme edge of the carriageway (especially on narrow bridges), assess the available lateral clearance and drive cautiously to avoid collision with the obstruction.

Vertical Clearance

Vertical clearance is the vertical distance between the highest point of the carriageway to the lowest point of the overhead structure. The roadway facilities are designed considering the physical dimension of vehicles (say, height, width, etc.). However, in some cases, the available vertical clearance may not be adequate for larger vehicles like trucks or buses. As a driver, it is your responsibility to assess the available vertical clearance (in the absence of sign) and ensure the safe passage of your vehicle. Also, it is your duty not to overload your vehicle (especially for commercial vehicles) or allow rooftop travel (especially for buses) with an added emphasis on safety while crossing an underpass.

Kerb

Kerb is a stone edging or raised path provided adjacent to the roads in order to strengthen and protect the pavement edge (Figure 1.5). It is provided for demarcation of medians, channelization near intersections, protection of pedestrians, etc. It may be mountable (i.e. vehicle can cross with some difficulties) or barrier type (which cannot be crossed safely). As a driver, you should respect the demarcation provided by the kerb and drive safely with a compatible speed.

Figure1.5 A typical view of kerb

1.4.2 Sight Distance

Sight distance is the length of the road ahead, which is visible to you while driving. Adequate sight distance is necessary for various manoeuvres, say stopping or overtaking. Available sight distance may reduce due to the presence of a horizontal curve (Figure 1.6) or a vertical curve. At all locations where sight distance is not adequate, it is necessary to reduce the speed so that you can stop the vehicle within available sight distance during an emergency. Also, on an undivided road with two-way traffic movements, you should not overtake another vehicle, if the sight distance available is not adequate. It is expected that all such locations where sight distance is restricted, appropriate signs will be provided related to the speed limit, no-overtaking, etc. Wherever, such restrictions are imposed you must respect those for your own safety. Even in the absence of such signs, it is your duty to reduce the speed of the vehicle so that you can stop the vehicle safely, if necessary. In the same spirit, it is your duty to avoid overtaking at locations where sight distance is not adequate.

Figure1.6 Restricted sight distance on a horizontal curve

Inadequate sight distance is also a major cause of accidents at intersections. Often due to the presence of buildings, shops, banners, trees, etc., the sight distance is restricted at intersections (Figure 1.7). If the stop or give-way sign (to be discussed later in Chapter 2) is provided, you must respect the sign and act accordingly for your safety and safety of other road users. Even in the absence of such signs, you should reduce your speed while negotiating intersections with inadequate sight distance. Several accidents occur as drivers do not understand the safety hazard due to inadequate sight distance or do not respect the signs.

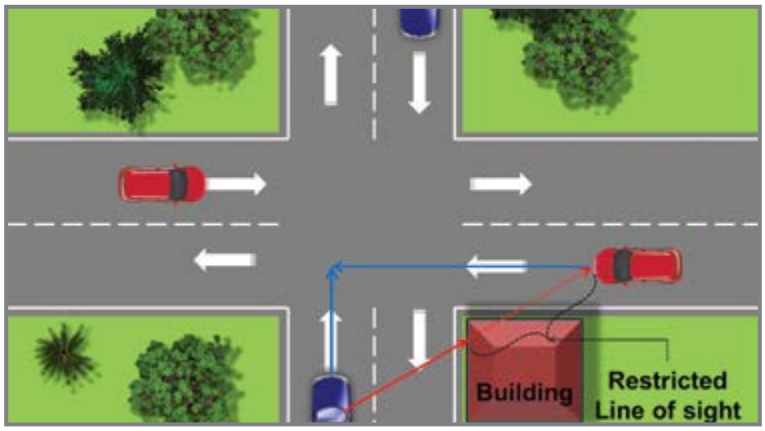


Figure1.7 Sight distance at intersection

1.4.3 Horizontal Alignment

Horizontal alignment of a road includes horizontal curve and superelevation. These are discussed briefly in the following subsections.

Horizontal Curve

You might have observed that the roads are not always straight. Horizontal curves are provided to change the direction or alignment of a road giving due considerations to the comfort and safety of vehicles. However, each horizontal curve is designed considering speed, and it is dangerous to cross that speed limit. It is extremely important for you to respect the posted speed limit, if any, for your own safety. Overspeeding even on a straight road is unsafe and on a curve, it is unquestionably dangerous. The speed of the vehicle is your choice, and so is your safety on curves.

Superelevation

It is important for you to know that on horizontal curves, a gradual slope is provided laterally by raising the outer edge of the pavement with respect to the inner edge. This is called as superelevation, and it is provided for a scientific reason to enhance your comfort and safety (Figure 1.8). Speed is an important consideration guiding the design of curve and superelevation. So, you must respect the speed limit on curves. It is also pertinent for you to know that while negotiating a curve, the front wheels and rear wheels of the vehicle do not follow the same path which is called off-tracking (Figure 1.9). Although in most cases, an extra widening of the carriageway is provided on curves for this purpose, it is important for you to keep in mind the off-tracking of the vehicle while negotiating a curve and crossing a vehicle from opposite direction (on an undivided road with two-way traffic movements).

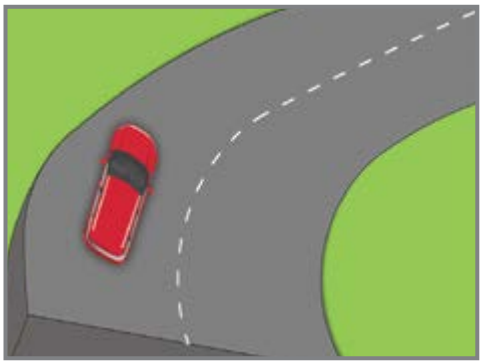


Figure 1.8 Superelevation on road

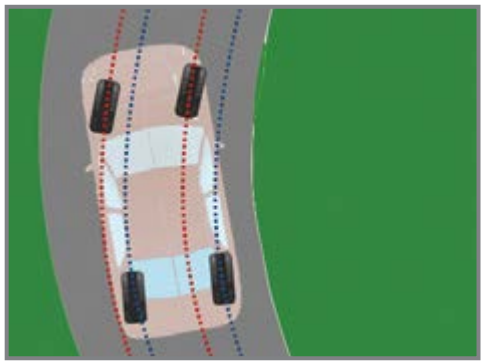


Figure 1.9 Extra widening on road

1.4.4 Vertical Alignment

This section deals with vertical alignment of the road which includes vertical gradients and vertical curves.

Gradient

The gradient is the rate of rise or fall along the length of the road with respect to horizontal plane. On long and steep upgrade, a reduction in speed is expected, especially for heavy commercial vehicles. You need to be extra careful in terms of selection of speed and manoeuvre (say, overtaking) while driving on a gradient. Also, on the undivided road with two-way traffic movements, the priority should be given to vehicles which are on upgrade as stopping and restarting of vehicles is difficult on upgrade.

Vertical Curves

Vertical curves are of two types, namely-summit curve and valley curve.

On summit curve, the sight distance may be restricted as shown in Figure 1.10. So, you need to control your speed and also avoid overtaking in such a situation on an undivided road with two-way traffic movements.

While driving on an upgrade of a valley curve during night time, only the length of the road illuminated by headlights is visible to you (Figure 1.11). In this case, also, you should restrict your speed, avoid overtaking and drive carefully as the sight distance is limited.

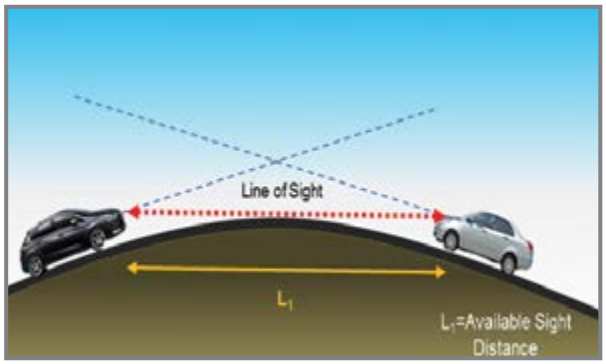


Figure 1.10 A typical view of summit curve

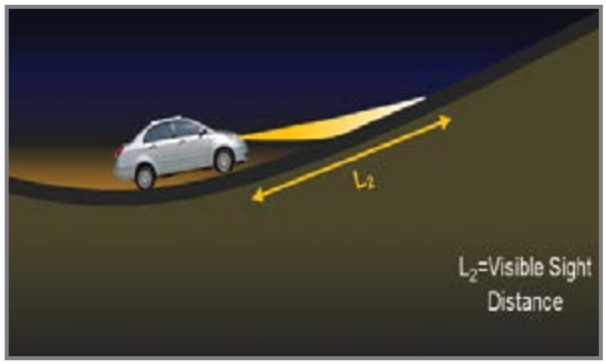


Figure 1.11 A typical view of valley curve

1.4.5 Intersection

Intersection is one of the most important road elements where two or more roads either meet or cross. In general, intersections are three-legged or four-legged. Intersections may be at-grade or grade separated. At-grade Intersections are either controlled or uncontrolled.

- Controlled intersections have traffic signals, yield signs or stop signs (to be discussed in Chapter 2) to control the traffic.
- An uncontrolled intersection is a road intersection without any sign/signal to indicate the right-of-way.

Conflicts at an Intersection

Several vehicular conflicts are generally observed at intersections. As shown in Figure 1.12, for a four-legged intersection with two-way traffic on all approaches, the number of conflict points is 32. All these conflicts may cause a road accident. Signals are provided at the intersection to eliminate such conflicts by time segregation of conflicting movements (i.e. conflicting movements are not allowed to occur simultaneously). On the other hand, grade separated facilities (say, flyover, interchange, etc.) are provided to segregate some or all conflicting movements spatially. While approaching controlled intersections, you must respect the traffic signal or traffic sign to avoid conflict and cross the intersection safely. Often at signalized intersections, pedestrians are present, and it is your duty to give priority to pedestrians at a zebra crossing or when the pedestrian signal is green. Even at other times, you should drive carefully to avoid conflict with pedestrians as they are highly vulnerable to road accidents. On uncontrolled intersections, the vehicle volume is generally low, and you should ensure that there is no conflicting traffic at the time of negotiating the intersection.

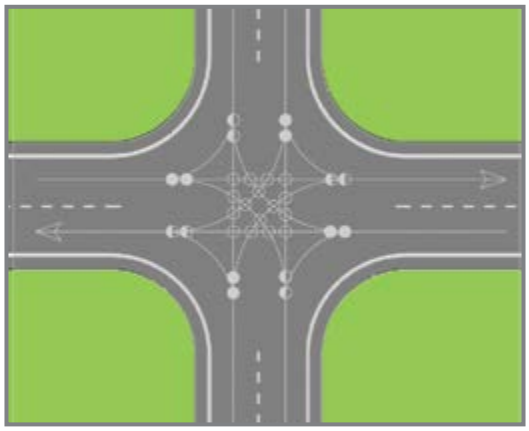


Figure 1.12 Conflicts at a four-legged intersection

1.5 Traffic Rotary

Traffic rotary is a type of road intersection where vehicles move around a central island in a clockwise direction (Figure 1.13).Therefore, you should always enter a traffic rotary in a clockwise direction. Sometimes, during the off-peak hours, drivers have a wrong tendency to negotiate traffic rotaries in an anti-clockwise direction to save time. This is an extremely unsafe practice, and you must refrain from doing such unsafe act. Always enter the traffic rotary in a clockwise direction regardless of the time and traffic condition.

Figure1.13 An example of traffic rotary

1.6 Traffic Island

Traffic island is generally a solid or painted object on the road for channelizing traffic (Figure 1.14). Traffic islands are provided to make traffic operation orderly, safe and efficient. You must respect traffic islands and should not drive your vehicle over traffic islands.

Figure1.14 An example of traffic island

1.7 Bypass

A bypass is a road that avoids or “bypasses” a built-up area, town, or village, to let the through traffic to flow without any interference from local traffic. Additionally, it reduces congestion in the built-up area. Hence, it is desirable for you to drive on a bypass road in the events of no work in the town, thereby save fuel and time.

1.8 Pedestrian Underpass (PUP)

Pedestrian underpass is a passage for pedestrians and cyclists, beneath a road or railway, allowing them to reach the other side safely (Figure 1.15). Passengers may be picked up and dropped off safely near PUP so that they would not require crossing road at-grade.

Figure1.15 An example of pedestrian underpass

1.9 Vehicular Underpass (VUP)

It is also an underpass, but for the vehicular movement beneath an existing road or railway track (Figure 1.16). You should not overspeed or overtake while driving through a vehicular underpass. This is mainly due to the restricted sight distance within VUP. As a driver, you must not hesitate to travel additional distance to avail the VUP rather than taking unsafe and unauthorised U-turn at-grade.

Figure1.16 An example of vehicular underpass

1.10 Overpass

When a bridge or a major highway is constructed by raising its profile above the general roads at ground level, it is known as overpass (Figure 1.17). The overpass is a facility where vehicles travel at high speed. You should drive carefully at all such locations and respect the posted speed limit.

Figure 1.17 An example of overpass

1.11 Foot Overbridge

A foot overbridge (FOB) is a bridge intended for the use of pedestrians, and, in some cases, cyclists. In general, pedestrians prefer to cross the road at-grade without using FOB mainly due to the additional effort of climbing up and down. Therefore, as drivers, even if FOB is present, you should be vigilant and drive cautiously around FOBs.

1.12 Exercise Questions

This section of the chapter consists of multiple choice questions. As per your understanding of this chapter, answer the questions asked by choosing one out of four options. An answer key is provided at the end of this Manual.

1. What is the category of road in an urban area with the highest mobility?

a) Arterial Road
b) Expressway
c) Local Street
d) Collector Road

2. What is the function of the shoulder?

a) Movement of vehicles
b) Emergency stopping of vehicles
c) Stone-edging to protect pavement edge
d) Parking of vehicles

3. What is the category of road in a Non-Urban area with the highest accessibility?

a) National Highway
b) Village Road
c) Major District Road
d) State Highway

4. What is the name of road element which is used for movement of vehicles?

a) Median
b) Kerb
c) Shoulder
d) Carriageway

5. What is the function of the median?

a) Demarcating carriageway and shoulder
b) Separating traffic movements in opposite direction
c) Parking of vehicle
d) All the above

6. The difference between the lowest point of the overhead structure and the highest point of the carriageway is known as_____

a) Sight Distance
b) Lateral Clearance
c) Kerb
d) Vertical Clearance

7. On which road element vehicles need to move round a central island in a clockwise direction?

a) Median
b) Traffic Rotary
c) Shoulder
d) Bypass

8. If you do not have any work in the city area which road you will chose to avoid interference from local traffic?

a) Local Street
b) Traffic Rotary
c) Bypass
d) Foot Over Bridge

9. What is the function of kerb?

a) Strengthen and protect the pavement edge
b) Parking of vehicles
c) Separating opposing traffic movements
d) None of these

10. The number of conflicts for an intersection may be reduced by providing _____

a) Traffic Signal
b) Flyover
c) Interchange
d) All the above

CHAPTER 2

Road Signs

Swati Maitra
&
Kinjal Bhattacharyya

2.1 Purpose of Road Signs

Unlike railways, roads are not uniform and homogeneous. While driving through a roadway which is a public space, you need to frequently negotiate through curves, junctions, construction zones, sensitive zones (schools, hospitals, etc.), and interact with other vehicular modes and/or pedestrians. Thus, while driving, for enhancing your own safety as well as the safety of other road users, you need to be constantly aware and stay informed of changing road features, roadside activities, etc. In this regard, road signs are our true friends on the roads as they assist us in several ways for a safe and comfortable drive. Road signs provide a warning to us of any change in the general pattern of the road in advance, guiding us to operate safely and efficiently in various situations and also informing us of different road-related rules and regulations. So, the major purpose of the road sign is two-fold:

a) To endorse safe, efficient and orderly driving and movement so as to promote road safety.

b) To provide information, guidance and caution about the necessary regulations of roads.

2.2 Legal Support and Code of Practice

Section 116 of the Indian Motor Vehicles Act, 1988 has covered all the signs warranted by different traffic situations. The Central Motor Vehicles Rules, 1989 have laid out all the legal rules related to the road signs. Rules specific to the state of West Bengal have been laid out in the West Bengal Motor Vehicles Rules, 1989. The methodology to be adopted in the use, placement, construction and maintenance of the road signs for different road categories has been set out in the Indian Roads Congress Guidelines IRC: 67-2012 “Code of Practice for Road Signs”.

This section of the manual is aimed to make you, the road user, aware of the importance of road signs and briefly describe some of the commonly used road signs for maintaining safe and efficient traffic operations. For further information on road signs and to know all road signs available in practice in India, you may refer to IRC: 67-2012.

2.3 Principles of Road Signs

There are five basic principles that govern the use of road signs for all road categories open to public travel. These are:

a) Road signs are provided to fulfil your needs while driving.
b) You should give attention to the road signs.
c) Road signs are designed in such a way that a clear and simple meaning is conveyed to you.
d) You should respect the road signs and act accordingly.
e) Road signs are placed in such a way that you get adequate time for response and perform a manoeuvre.

2.4 Placement, Operation, and Uniformity of Road Signs

The road signs are placed within your view and positioned with respect to the location or situation to aid in conveying proper meaning. The road signs are located and made sufficiently legible with a view to provide adequate response time so that you can read and take necessary action at the operating speed. The road signs are also made uniform to simplify your tasks as they help in recognising and understanding, thereby you can take necessary action while driving and avoid any unsafe or unintended situation in much shorter time.

2.5 Type of Road Signs

There are three broad categories of road signs viz. Mandatory/Regulatory Signs, Cautionary/Warning Signs, and Informatory/ Guide Signs (Figure 2.1). These are further explained in the following sections.

Figure 2.1 Classification of road signs

2.5.1 Mandatory/Regulatory Road Signs

Mandatory signs are of paramount importance because they are directly related to safety and efficiency. Mandatory or regulatory signs need to be complied with and any violation of the rules and regulations conveyed by these signs is a legal offence. Mandatory/ Prohibitory signs are to indicate the prohibition upon certain kind of vehicle manoeuvre. For example, restriction on overtaking like “Overtaking Prohibited”; restriction on parking like “Parking Prohibited”; limit on vehicle speed like “Speed Limit” and so on. How will you identify such signs? It is very easy. All mandatory or regulatory signs are circular in shape except the “Stop” sign and “Give Way” sign which will be discussed later. Examples of these signs are shown in Figure 2.2.

Figure 2.2 Examples of mandatory/regulatory signs

2.5.2 Cautionary/Warning Road Signs

As mentioned earlier, road features and roadside activities are always changing. Cautionary signs are there to caution and alert you of potential danger or existence of certain hazardous conditions either on or adjacent to the roadway so that you can take the desired action for your safety. These signs indicate a need for special caution and may require a reduction in speed or some other vehicle manoeuvre. Like mandatory signs, it is also very easy for you to identify cautionary signs. All cautionary or warning signs are triangular in shape with apex pointing upward with a red border and black symbol in the white background. Some of the cautionary signs are Hairpin Bend, Narrow Bridge, Gap in Median, School Ahead, etc. A few examples of these signs are shown in Figure 2.3.

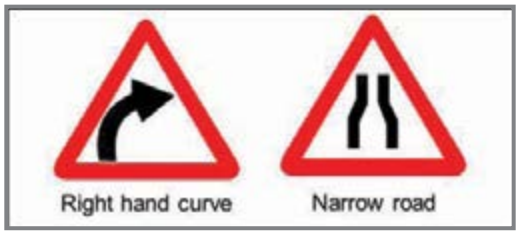


Figure 2.3 Examples of cautionary/warning signs

2.5.3 Informatory/Guide Signs

While driving, you may feel the need to access different types of facilities such as petrol pumps, eateries, etc. You also sometimes require some guidance to reach your destination while driving in a new area. In such situations, informatory signs will serve your needs. Informatory Signs for facilities indicate location and direction to facilities like “Fuel Station” or “Eating Place” or “Parking”. It is again very easy to spot these signs. All Informatory signs and Guiding signs for facilities are rectangular in shape (Figure 2.4).

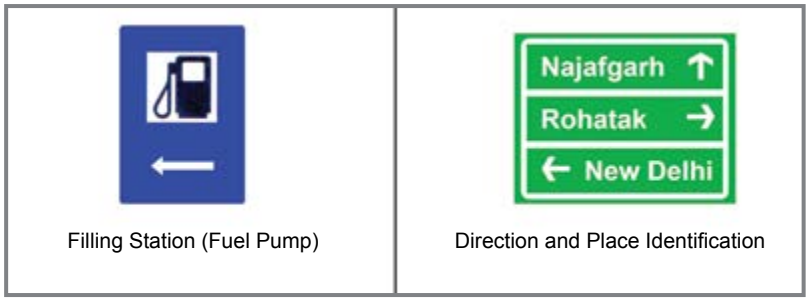


Figure 2.4 Examples of informatory/guide signs

Direction information signs in a rectangular shape are used with destination names and direction with arrows. The colour pattern of direction information sign is different for different road categories and is presented in Table 2.1. These are used to give information which will help you along the route in most simple and direct manner. You can also quickly identify on which type of road you are driving based on the colour of these signs.

Table 2.1 Colour pattern of direction information sign for different road types

Road Type	Background Colour	Arrows/Border/Letters
Expressway	Blue	White
National Highway (NH)	Green	White
State Highway (SH)	Green	White
Major District Road (MDR)	Green	White
Village Road (ODR & VR)	White	Black
Urban/ City Road	Blue	White

2.6 Mandatory/Regulatory Signs

The mandatory/regulatory signs are listed in Table 2.2. They are classified under the following six sub-heads based on their purpose.

a) “Stop” and “Give Way” signs (Right of Way signs)

b) “Prohibitory” signs

c) “No Parking” and “No Stopping” signs

d) “Speed Limit” and “Vehicle Control” signs

e) “Restriction Ends” sign

f) “Compulsory Direction Control” and other signs

Regulatory signs that indicate the beginning of a restriction or prohibition and to which direction it applies are placed on each side of the road or on each side of the appropriate carriageway of a dual carriageway road. The signs are placed on one side if any of the following circumstances apply.

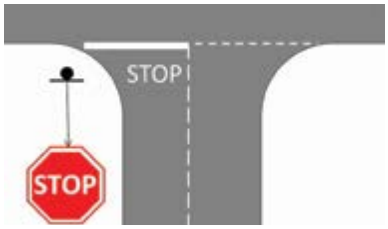
a) Where the restriction, requirement or prohibition applies only to one side of the road.

b) At a junction where traffic turns from a one-way road into the relevant road.

c) At a junction where the carriageway of the relevant road is less than 5m wide and the centre of the sign is not more than 2m from the edge of the carriageway.

Mandatory/regulatory signs are typically sited at or near the point where the instruction applies.

Table 2.2 Mandatory/Regulatory signs and their descriptions

Serial No.	Sign	Sign Name	Sign Description	
A	**"Stop" and "Give Way" Signs**			
A1	Octagonal in shape. Red background with White border. STOP written in White.	STOP	**Purpose:** This is for indicating a priority for the right of way. The sign is used on roadways where traffic is required to stop before entering a major road. When you see this sign, you have to stop your vehicle and you can proceed past the stop line only after ascertaining that this will not cause danger to the traffic on the main road.	**Location:** Installed on left side of the approach to which it applies. STOP sign is placed as close to the STOP line without obstructing vision to the major road. Normally, it is fixed 1.5m in advance of the stop line. 
A2	Equilateral Triangle with apex downwards. Red border and White background.	GIVE WAY	**Purpose:** This is for assigning right of way to traffic on certain roadways at intersections, the intention being that the vehicles controlled by the sign must give way, i.e., yield to other traffic having the right of way. When you see this sign, you need to slow down or stop when necessary to avoid any interference with conflicting traffic.	**Location:** Installed in advance to point where vehicles are required to stop or slow down. It is provided on the minor road to assign give way to major road traffic but the stop is not necessary; at roundabouts to give way to the traffic coming from the right; to give way to the traffic coming uphill on hill road; for roadside parking to give way to the traffic on the major road.
B	**"Prohibitory" Signs**			
B1		Bullock Carts and Hand Carts Prohibited	This sign is erected at the entry of roads where not only bullock carts and hand carts but all types of slow moving vehicles except cycles are prohibited.	

Serial No.	Sign	Sign Name	Sign Description
B2		Cars Prohibited	This sign is used where entry of car is prohibited.
B3		Trucks Prohibited	This sign is erected on each entry to the road where movement of trucks is prohibited.
B4		Two Wheelers Prohibited	This sign is erected on such highways or highway sections where the movement of two wheelers is required to be prohibited.
B5		Cycles Prohibited	This sign is erected on each entry to the road where cycles are prohibited.
B6		Blowing Horn Prohibited	This sign is used on stretches of the road where honking is restricted, such as near hospitals and in silence zones.
B7		Straight Prohibited/ No Entry	This sign is located at places where any vehicle is not allowed to enter. It is generally erected at the end of the one-way road to prohibit traffic entering the roadway in the wrong direction and also at each intersection along the one-way road. The sign is mounted on the left side of the roadway, facing traffic that might enter the roadway or ramp in the wrong direction.
B8		One Way	This sign is located at the entry to the one-way street and repeated at intermediate intersections on that street. At unsignalized intersections, ONE WAY signs are placed at the near left and the far right corners of the intersection facing traffic entering or crossing the one-way street. At signalized intersections, ONE WAY signs are placed either near the appropriate signal faces, on the poles holding the traffic signals, on the mast arm or span wire holding the signals, or at the locations specified for unsignalized intersections.
B9		Left/ Right Turn Prohibited	At the unsignalized intersection where a side-road forms a T-junction with a two-way road and traffic is required to turn in one direction only, Left Turn or Right Turn Prohibited signs are used. These signs are also used at the intersection of a one-way street to supplement the ONE WAY signs.

Serial No.	Sign	Sign Name	Sign Description
B10		Overtaking Prohibited	This sign is erected at the beginning and at intervals within, of such sections of road where sight distance is restricted and overtaking will be hazardous, thus prohibiting overtaking of vehicles at those locations. When you see this sign you should not try to overtake the preceding vehicle at that location. It is important for you to wait for the danger zone to pass and then perform the overtaking manoeuvre, if necessary.
B11		U-Turn Prohibited	This sign is used at places where vehicles are forbidden to make a turn to reverse the direction of travel between the sign and the next intersection beyond it.
C	**"No Stopping" and "No Standing" signs**		
C1		No Standing	At locations where "No Standing" sign is erected, a vehicle is prohibited to stand but may stop only momentarily for pick-up and drop-off passengers.
C2		No Stopping and No Standing	This sign is erected on sections of a road or street where the controlling authority has decided to prohibit standing and even momentarily stopping of vehicles except for emergency or instruction from police.
C3		No Parking	The "No Parking" sign is used on roads to prevent any parking of vehicles on main carriageway. Normally, such signs are there in urban areas.
C4		Parking not Allowed on Foot Path	This sign is erected where parking is not allowed on footpath. Normally, parking should not be done on footpath unless permission is given explicitly by the authority.
D	**"Speed Limit" and "Vehicle Control" Signs**		
D1		Axle Load Limit	This sign is erected where entry is prohibited for vehicles with axle load exceeding specified limit as mentioned in the sign.
D2		Height Limit	This sign is erected before an overhead structure where entry is prohibited for vehicles when height exceeds a certain limit as specified in the sign.

Serial No.	Sign	Sign Name	Sign Description
D3		Load Limit	This sign is erected where entry is prohibited for vehicles whose laden weight exceeds a certain limit as specified in the sign.
D4		Width Limit	This sign is used where entry is prohibited for vehicle whose width exceeds the limit as specified in the sign.
D5		Maximum Speed Limit	This sign is located at the beginning of the section of the road or area covered by a speed restriction, with numerals indicating the speed limit in km per hour. In case of vehicle category specific speed limit, a symbol of vehicle category accompanies such speed limit sign.
E		Restriction Ends	This sign indicates the point at which all prohibitions notified by prohibitory signs in the upstream section cease to apply.
F	**Compulsory Direction Control and Other Signs**		
F1		Compulsory Ahead, Compulsory Ahead or Turn Right, Compulsory Ahead or Turn Left	These signs indicate the routes that are lawfully to be taken and direction of movements with respect to the position of sign installed.
F2		Compulsory Turn Right/ Left	These signs indicate the routes that are lawfully to be taken and direction of movements with respect to the position of sign installed.
F3		Compulsory Turn Right/ Left in advance of Junction	These signs are used ahead of the junction to indicate routes that are lawfully to be taken while entering the junction. Compulsory turn left is placed on Central Island of a roundabout to be seen by drivers on the approach road.

Serial No.	Sign	Sign Name	Sign Description
F4		Compulsory Keep Right/ Left	Compulsory Keep Left sign is used at traffic islands, refuges, and at the beginning of central median of a divided carriageway. It is used at the recommencement of central median following a gap. Compulsory Keep Right sign is used in traffic calming schemes and also in association with road works.
F5		Pass Either Side	This sign is used on traffic islands, usually in one-way roads, where drivers passing either side of the sign reach the same destination immediately ahead.
F6		Compulsory Cycle Track/ Cycles only	This sign is to notify cyclists that they must use the cycle track at the entrance to which it is placed and notify the drivers of other vehicles that they are not entitled to use that track.
F7		Pedestrians only	This sign means that only pedestrians are allowed and the traffic is not allowed on this road/ carriageway segment. The sign may also be supported by a supplementary plate with “PEDESTRIANS ONLY” written on it.
F8		Busway/ Buses only	This sign notifies that only buses are allowed and the other traffic is not allowed on this road/ carriageway segment. The sign may be supported by a supplementary plate with ‘BUSES ONLY’ written on it.
F9		Compulsory Sound Horn	This sign means that the motor vehicles must sound horn at the location at which sign is placed. It is generally placed at sharp curves.

2.7 Cautionary/Warning signs

The Cautionary/Warning signs are to caution or alert you of potential danger/ hazard ahead of your road. The signs are listed in Table 2.3.

They are in the shape of an equilateral triangle, with the apex pointing upwards. It has a red border and black symbols on white background.

When two or more warning signs are erected together, the sign relating to the hazard first encountered is placed uppermost.

Table 2.3 Cautionary/Warning signs and their descriptions

Serial No.	Sign	Sign Name	Sign Description
1		Left/ Right Curve	These signs are intended to warn you to reduce the speed and proceed cautiously when a road has certain curves where it will be unsafe to negotiate with the absolute speed limit or the general operating speed established for the road.
2		Right/ Left Hairpin Bend	These signs are used to mark curves of small radii, where the change of direction is so considerable as to amount to a reversal of direction.
3		Right/Left Reverse Bend	These signs are provided where there are two curves in opposite direction. The sign is also provided where, in the opinion of the controlling authority, the nature of the reverse bend will not be obvious to you and constitutes a hazard. If the first curve is to the right, a right reverse bend sign is used, and if it is to the left, a left reverse bend sign is used.
4		Series of Bends	This sign is used to caution you of the presence of zig-zag bends for a long distance over the section of road ahead.
5		Side Road	These signs are erected in advance of the main road intersections where a sufficiently large volume of entering traffic from the side road together with restricted sight distance is likely to constitute a hazard.
6		Y-Intersection	These signs are erected on the approach to a bifurcation of any road to warn you of the existence of such a junction.
7		Cross Road	The sign is provided in advance of the crossroad where a sufficiently large volume of entering traffic together with restricted sight distance is likely to constitute a hazard.
8		Roundabout	The sign is used where it is necessary to indicate the approach to a roundabout, and adequate warning has not been conveyed previously.

Serial No.	Sign	Sign Name	Sign Description
9		T-intersection	These signs are provided in advance of T-junctions where, in the opinion of the controlling authority, the nature of the intersection is not obvious to you. The width of bands indicates the relative importance of the roads, wider the band more important is the road.
10		Staggered Intersection	These signs are used to warn you of closely spaced junctions where the distance between two junctions does not exceed a minimum distance.
11		Merging Traffic Ahead	These signs are posted in situations where the traffic from other road is merging and the drivers are required to slow down their vehicles for safe travel. In special cases of interchanges, merging from the right-hand side can also happen which is indicated by the appropriate sign.
12		Narrow Road Ahead	The sign is provided on such sections of roads, where a sudden reduction in width of pavement may cause a danger to the traffic.
13		Narrow Bridge Ahead	The sign is provided on roads in advance of bridges where the clear width between kerbs or wheel guards is less than the normal width of the carriageway.
14		Steep Ascent	The sign is used at a safe distance from a steep upgrade where the steepness of the upgrade warrants a warning to the road users.
15		Reduced Carriageway	These signs are used to caution you of the reduction in the width of the carriageway to the left-hand side or right-hand side ahead. This is also applied in an undivided carriageway where some portion of the carriageway is closed or reduced for maintenance or repairs.
16		Gap in Median	The sign is installed ahead of a gap in the median of a divided carriageway, other than at an intersection.
17		Pedestrian Crossing	The sign is erected in advance on both approaches to uncontrolled pedestrian crossings. The sign is sometimes repeated at a short distance ahead of the pedestrian crossing, indicating the distance to the crossing with a supplementary plate.

Serial No.	Sign	Sign Name	Sign Description
18		School Ahead	This sign is provided where school buildings or grounds are adjacent to the road and where the passing traffic can create a hazard to the school-going children. You need to drive cautiously where such sign is erected.
19		Two Way Operation	This sign is used to caution you of a changed pattern of traffic condition on a carriageway expected to carry traffic in one direction only. For example, on a dual carriageway, the entire traffic is diverted to one side because of emergency or road work. In such situation, you are warned by posting this sign.
20		Lane Closures	These signs are used to caution you of the closure of a portion of the carriageway on multi-lane highways.
21		Traffic Diversion on Dual Carriageway	This sign is used to warn you of the diversion of traffic from one carriageway to the other. Mostly it is used on a dual carriageway when one carriageway is closed for maintenance or due to an incident.
22		Men at Work	This sign is displayed when men or machines are working on the road or adjacent to it or on overhead lines or poles. The sign is generally located on the approach side of the work zone or area and another sign with supplementary plate 'END' is provided at the leaving side of the work zone where the traffic can revert to normal operations.
23		Danger Warning	This sign is posted in situations where you may face any kind of danger and required to slow down your vehicle for safe travel.
24		Deaf or Blind Persons Likely on Road Ahead	These signs are posted near the schools or institutions meant for hearing impaired persons and blind persons. The sign to the left indicates deaf persons ahead while the other indicates Blind persons ahead.
25		Cycle Crossing	This sign is provided in advance of uncontrolled cycle crossings.

Serial No.	Sign	Sign Name	Sign Description
26		Cycle Route Ahead (Warning for Cycles on Road Ahead) (Mixed Traffic Conditions)	This sign is posted in a situation where the Cycle Route is approaching, and you are required to slow down your vehicle.
27		Dangerous Dip	The sign is provided where a sharp dip in the profile of the road or a causeway is likely to cause considerable discomfort to traffic.
28		Speed Breaker	This sign is used to warn you of the presence of the speed breaker and is posted at a safe distance in advance of the speed breaker location so that you can perform necessary speed reduction and avoid vehicle damage or any unsafe situation.
29		Rumble Strip	The sign is posted in advance of the rumble strips provided on the road to control and reduce the speed. This is to warn you of the presence of the rumble strips.
30		Dangerous Ditch	This sign is posted in situations where the road has a ditch, and you are required to slow down your vehicle for safe travel.
31		Loose Gravel	The sign is used on a section of a road on which gravel may be thrown up by fast moving vehicles.
32		Slippery Road	This sign is erected to warn that the section of the road ahead may be particularly slippery.
33		Overhead Cable	This sign is used to caution you of the presence of overhead power transmission lines.

Serial No.	Sign	Sign Name	Sign Description
34		Playground Ahead	This sign is used to caution you about approaching playground for children and is placed at the beginning of such area.
35		Quay Side or River Bank	This sign is used to caution you of presence of the impending danger by the side of the road due to the presence of the water body.
36		Tunnel Ahead Warning	This sign is posted in situations where the traffic approaches a tunnel, and you are required to slow down your vehicle for safe travel.
37		Cattle Crossing	This sign is erected where there is a danger due to farm animals or cattle crossing the road.
38		Wild Animals likely to be on Road Ahead	This sign is posted in situations where the wild animals may cross the road and you are required to slow down your vehicle for safe travel.
39		Unguarded Railway Crossing	These signs are used on approaches of railway level crossings where there are no gates or other barriers. A pair of signs are used for the purpose: (i) an advance warning sign located at 200m away from the crossing, and (ii) a second warning sign near the crossing (50-100m in plain and rolling terrain and 30-60m in hilly terrain).
40		Guarded Railway Crossing	These signs are used to warn traffic on the approaches to guarded railway crossings. A pair of signs are used for the purpose: (i) an advance warning sign located at 200m away from the crossing, and (ii) a second warning sign near the crossing (50-100m in plain and rolling terrain and 30-60m in hilly terrain).

Serial No.	Sign	Sign Name	Sign Description
41		Chevron (Single, Double, and Triple)	At the curved alignment of a roadway, the chevron signs are used to inform you about the sharpness of the curve. They are installed on the outside of a turn or curve to provide you with adequate time to react to the change in alignment. Depending upon the sharpness of the curve, Single Chevron, Double Chevron, and Triple Chevron signs are installed.
42		Hazard Marker (Left side, Right side, Two-Hazard Marker)	Roadside hazards like bridges, trees, etc. which are coming in the roadway are illuminated by retro-reflective Object Hazard Markers (OHM). Left side hazard marker is used for left side hazard so that traffic is allowed to pass from the other side (right side), while right side hazard marker is used for right side hazard so that traffic is allowed to pass from the other side (left side). Two-hazard marker is used if traffic is allowed to pass on either side of any triangular island/ hazard.

2.8 Informatory Signs

The Informatory signs give you information regarding your current location or facilities available in the vicinity or about the destination. You can easily identify these signs on roadways as these are generally rectangular in shape. The different Informatory signs are listed in Table 2.4.

The signs are classified under the following subheads.

a) Direction and Place Identification signs

b) Facility Information signs

c) Other Useful Information signs

d) Signs for Persons with Disabilities

e) Route Marker Signs

Table 2.4 Informatory signs and their descriptions

Serial No.	Sign	Sign Name	Sign Description
A		**Direction and Place Identification**	It has the following functions: a) Provide advance information to you of your approach to a junction b) Indicate the type of junction c) Inform you of the destinations that may be reached from each exit d) Identify the route and indicate its status within the network
B	**Facility Information Sign**		Rectangular shape with Blue Background and Black Symbols in white square
B1		Eating Place	The sign is posted to indicate where a regular eating place is located.
B2		Light Refreshments	The sign is used to indicate a place where light refreshments would be available.
B3		Resting Place	The sign is used to indicate the place where facilities for resting and lodging would be available.
B4		First Aid Post	The sign is used to notify you on long stretches of roads in rural areas of the first aid facility which may be helpful in case of emergency.
B5		Toilet	The sign is used to inform about toilet facilities.
B6		Filling Station (Fuel Pump)	The sign is erected on long stretches of roads in rural and urban areas at the entry to the road leading to the facility including CNG filling stations.

Serial No.	Sign	Sign Name	Sign Description
B7		Hospital	The sign is used to notify that you should take the precautions near medical establishments and that you should not, in particular, make unnecessary noise. The sign also serves to indicate the location of the hospital where medical facilities will be available.
B8		Public Telephone	The sign is erected on long stretches of road in rural areas indicating the distance to the nearest public telephone on the supplementary plate.
B9		Pedestrian Subway/ Foot Over Bridge	These signs are provided to guide the pedestrian traffic about the location of subway or pedestrian foot over bridge.
B10		Police Station	This sign is erected at places where the police station is situated nearby.
B11		Repair Facilities	The sign is erected at the places where repair facilities are available.
B12		Railway Station/ Metro Station/ Monorail Station	The sign is provided at the places where railway station/ metro station or any other mass transit station is situated nearby.
B13		Industrial Area	The sign is used to inform you about an industrial area nearby.
B14		Cycle-rickshaw/ Auto-rickshaw/ Taxi Stand	These signs are provided where the cycle-rickshaws or auto-rickshaws or taxis are to wait.
B15		Airport	The sign is erected at the places where the airport is situated nearby.

Serial No.	Sign	Sign Name	Sign Description
B16		National Heritage	The sign is used to inform you about National heritage area.
B17		Toll Road Ahead	This sign provides information to all vehicles about toll roads.
B18		Country Border	The sign is used to inform you about the border of the country.
B19		Bus Stop	This sign is provided at places where the buses are designated to stop.
B20		Bus Lane	This sign is installed to inform you of the presence of reserved bus lane in the carriageway.
B21		Contra Flow Bus Lane	This sign is installed to indicate the presence of bus lane to permit the operation of buses in the opposing direction of flow on one-way streets.
B22		Cycle Lane	This sign provides information about a cycle lane.
C	**Other Useful Information Signs**		
C1		Parking	The parking sign indicates the places where parking of vehicles is authorized.
C2		Auto Rickshaw Parking/ Cycle Rickshaw Parking	These signs indicate places for auto rickshaw/ cycle rickshaw parking.

Serial No.	Sign	Sign Name	Sign Description
C3		Cycle Parking / Scooter and Motorcycle Parking	These signs indicate cycle/ scooter and motorcycle parking.
C4		Taxi Parking	This sign indicates taxi parking
C5		Park and Ride	These signs are provided where parking is allowed only for riding the public transport vehicles.
C6		Parking Restriction for Traffic Management	These signs are erected where parking is not allowed for some specified durations for traffic management.
D	**Signs for Persons with Disabilities**		
D1		International Symbol of Accessibility (ISA)	It is also known as the international wheelchair symbol. It is used as an informatory sign with a blue background and image of a person using a wheelchair overlaid in white.
D2		Parking Information	The parking area is indicated using a signage to reserved vehicle parking for users with disabilities. Since the wheelchair is always shown facing right, the direction of the parking is indicated using an arrow.
D3		Ramped Entrance to Subway/Over Bridge	These signs inform the persons with disabilities about the ramp facility to enter pedestrian subway/ foot over bridge.
D4		Telephone Facility	Telephone facility is indicated using a signage for persons with disabilities.
D5		Toilet Facility	Toilet facility is indicated using a signage for persons with disabilities.

Serial No.	Sign	Sign Name	Sign Description
D6		Way Finding Sign for Disabled	Way finding sign is indicated using a signage for disabled persons.
E	**Route Marker Signs**		• Uniform Shape for different type of roads. • Colour coded and simple shape for better recognition. • Prominence to number of route and colour of background for quick grasp by driver.
E1		State Highway Route Marker	The State Highway (SH) Route Marker sign consists of a shield with retro-reflective green colour base and white symbol and border on a rectangular plate.
E2		National Highway Route Marker	The National Highway (NH) Route Marker sign consists of a shield with retro-reflective yellow colour base and black symbol and border on a rectangular plate.
E3		Asian Highway Route Marker	The Asian Highway (AH) Route Marker sign consists of a shield with retro-reflective brown colour base and white symbol and border on a rectangular plate.
E4		Expressway Route Marker	The Expressway Route Marker sign consists of a shield with retro-reflective blue colour base and white symbol and border on a rectangular plate.

2.9 Exercise Questions

1. Violation of which type of road sign is a legal offence?

a) Warning Sign
b) Mandatory Sign
c) Informatory Sign
d) All of the Above

2. What should you do when you see the Sign below?

a) Proceed at the same speed without stopping
b) Slow down, look left and right, and proceed cautiously
c) Come to a complete halt at the stop line, look left and right, and proceed with caution
d) Stop the vehicle immediately and proceed after inquiry with the traffic police

3. Identify the "Series of Bends" Sign.

a)

b)

c)

d) Both (a) and (c)

4. Which side of the road should you move when you see this "Hazard Marker" Sign?

a) Move Left
b) Move Right
c) Drive Straight
d) Both (a) and (b)

5. Which traffic sign should you expect near a "School Zone"?

a)

b)

c)

d) All of the Above

6. What does this sign indicate?

a) No Parking
b) No Stopping
c) No Standing
d) All of the Above

7. Which of the below is a "Speed Breaker" Sign?

a)

b)

c)

d) Both (b) and (c)

8. What does this sign symbolize?

a) Road closed ahead
b) No left turn
c) No right turn
d) No U-turn permitted

9. What does this sign symbolize?

a) Narrow road ahead
b) Narrow bridge ahead
c) Junction ahead
d) None of the above

10. Which sign do you expect near a "Construction Zone" on a dual carriageway road?

a)

b)

c)

d)

11. What does this sign indicate?

a) Road closed ahead
b) No left turn permitted
c) No right turn permitted
d) No overtaking permitted

12. What does this sign symbolize?

a) No Passing
b) Road Closed Ahead
c) No Parking
d) None of the Above

13. What does this sign symbolize?

a) Traffic moving in both directions
b) Divided highway ahead
c) One-way road ahead
d) None of the above

14. What does this sign symbolize?

a) Toilet
b) Pedestrian Area
c) Recreation Area
d) None of the Above

15. What should you do when you see the sign below while approaching from a minor road to a junction?

a) Allow other vehicles to overtake you
b) Allow only emergency vehicles to overtake you
c) Change lane
d) Slow Down, wait for safe gap and then drive

CHAPTER 3

Road Markings

Arkopal Goswami,
Kuldeep Kavta
&
Shubhajit Sadhukhan

3.1 Background

Road markings play an important role in guiding and controlling traffic on the road. If you understand road markings and drive accordingly, then your safety and the safety of other road users can be improved significantly. The advantage of road markings is that these will provide you with information without distracting your attention from the road. The markings will not only guide you when you are driving a vehicle but also assist you while you are either walking or riding your bicycle on the road.

Just as a good friend who will always be there for you in your life, road markings will also be there to the road users throughout the journey on the road. Friends are of different nature, some guide you regularly, some warn you and some control you when you are not on the correct path. Similarly, road markings are of different types based on the purpose they serve. Hence, it becomes important for you to understand your friends on the road i.e. “Road Markings”. This chapter aims to convey the meaning of different road markings to understand what need to be done when you see a particular type of road marking while driving.

3.2 Definition

The Indian Roads Congress code of practice for Road Markings (IRC: 35-2015) defines road markings as lines, patterns, words (except for road signs) which are painted on the carriageway, kerbs or to objects within or adjacent to the carriageway to control, warn, guide and inform road users.

3.2.1 Colours for Marking

Road markings can be of different colours. Most commonly used colours are white and yellow. Other colours that are being used for road markings include blue, green, and red/purple. These colours reflect light and will help you in all weather conditions.

The use of white and yellow colour is shown in Figure 3.1. Yellow colour markings are used to indicate restriction. For example, in Figure 3.1, it indicates the dividing line between two directions of traffic and tells you that while driving on one side of the road you cannot cross over the lane to the other side. It is also used in other areas such as no parking zones, no stopping zones, etc. The white colour markings used in Figure 3.1 are (a) arrows, which tell you the direction in which you should drive; and (b) edge lines, which tell you that you shall cross those lines

only for stopping in emergencies. The white colour markings are permissive in nature and not as restrictive as the yellow colour markings.

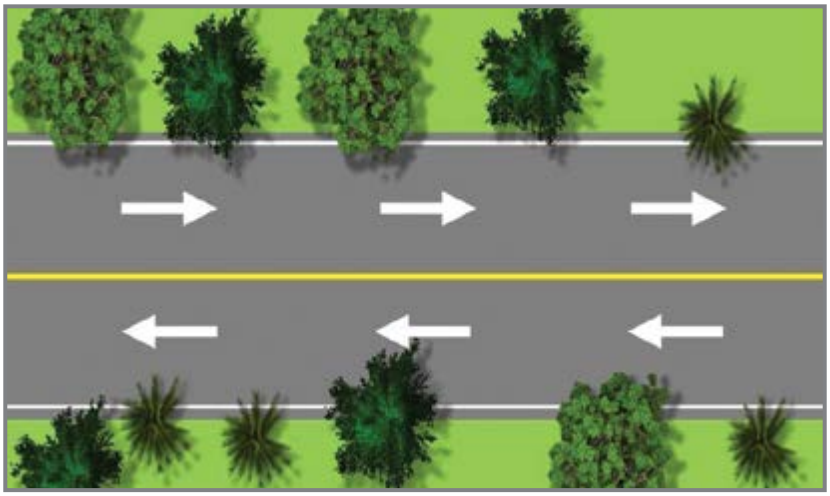


Figure 3.1 Yellow and white coloured road markings

The other colours are meant for different purposes. For example, the blue colour is used to indicate separate lanes for public transportation, such as Bus Rapid Transit System (BRTS). The green colour is used to distinguish the bicycle lanes from other lanes provided on the road. Red or purple colours will help you to understand the upcoming danger. The red colour is used at hazardous intersections where there is a large number of vehicles and pedestrians crossing each other.

3.3 Classification of Pavement Markings

Pavement markings are broadly classified into following categories.

a) Longitudinal markings: These markings are placed along the direction of driving and guide vehicles for lateral placement.

b) Intersection markings: Some road markings are provided at the intersection to ensure the smooth movement of vehicles and pedestrians at intersection and help in changing the direction of movement.

c) Other markings: Apart from longitudinal and intersection markings, the road has many other features like parking, objects, etc. Road markings play a vital role to keep you informed as a driver or a road user about such features.

3.3.1 Longitudinal Markings

3.3.1.1 Centre Line

A centre line separates opposite directional traffic. While driving on the road, you must have a clear idea of the space meant for driving. A centre line may be broken, or continuous depending on the type of road and conveys a different meaning. The interpretations of different types of centre line are given below (Figure 3.2 to Figure 3.5).

Figure 3.2 Broken single centre line

Interpretation

(Broken Single Centre line):

You may cross this line if sufficient clearance is available. It is permissive in nature.

Figure 3.3 Solid single centre line

Interpretation

(Solid Single Centre line):

You are not allowed to cross this. This line is restrictive in nature.

Figure 3.4 Solid double centre line

Interpretation

(Solid Double Centre line):

Double solid line indicates maximum restriction of crossing. Vehicle should not cross the line by any chance.

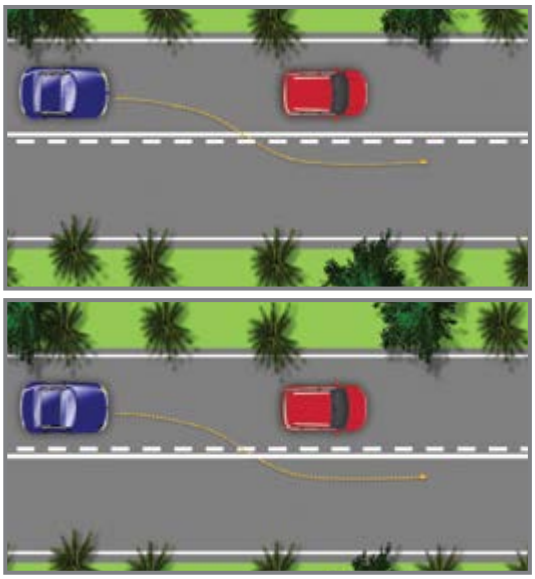


Figure 3.5 Combined centre lines

Interpretation (Combined Centre line):

If solid line is nearer to you, crossing the line is not permitted.

If broken line is nearer to you, crossing the line is permitted.

3.3.1.2 Traffic Lane

When the road is wide, it is separated into lanes to give an idea to you for driving in a particular lane. Lane markings ensure safe movement of traffic and prevent accidents. Lane markings indicate that your vehicle should not sway from one lane to another and should move only on a particular lane in a disciplined manner. Two examples of lane markings are given in Figure 3.6 and Figure 3.7.

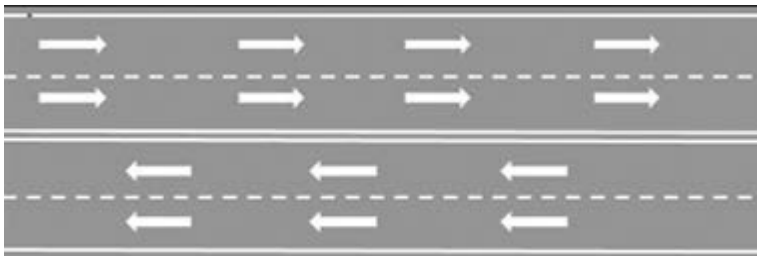


Figure 3.6 Lane markings for four lane with solid double centre line

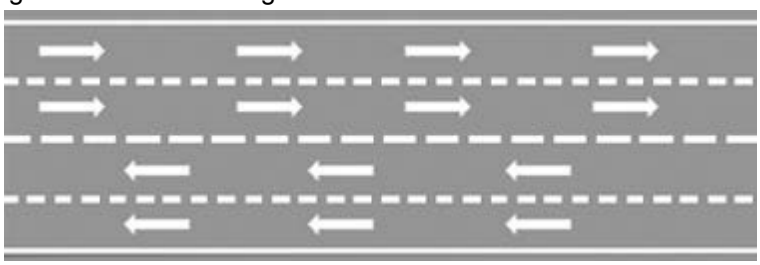


Figure 3.7 Lane markings for four lane with broken single centre line

Interpretation (Lane marking):

Drivers should drive in particular lane and avoid meandering.

3.3.1.3 No Overtaking Zone

At some hazardous locations like where a road bends sharply to the right or left, or where the road has a steep upward or downward slope, overtaking can cause accidents. In order to make you aware as a driver not to overtake at such locations, the following types of double solid white line road markings (as shown in Figure 3.8 and Figure 3.9) are used to designate the location as no overtaking zone:

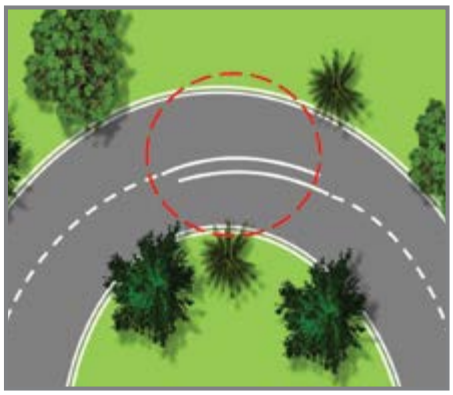


Figure 3.8 Marking for no overtaking at vertical curve

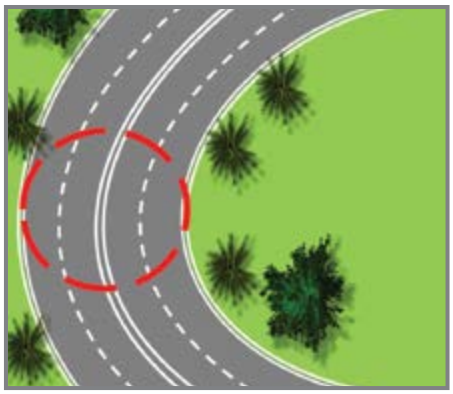


Figure 3.9 Marking for no overtaking at horizontal curve (double solid)

Interpretation

(No overtaking zone):

Overtaking of vehicle is restricted in this zone due to hazardous condition.

3.3.1.4 Warning Lines

Warning lines caution you about an upcoming hazardous location ahead on the road. You will find such warning lines in locations when there are sharp bends in the road, steep curves, or an obstruction on the road such as a tree, electric post, structures, etc. (Figure 3.10). The warning lines are similar to a centre line, which means they are broken white lines. The only difference you will see in warning lines is that the spacing is smaller as compared to the centre line. Hence, when you are about to approach some hazardous locations, the centre line gets changed to warning lines, and you can recognize this change by the reduced spacing of the broken white line.

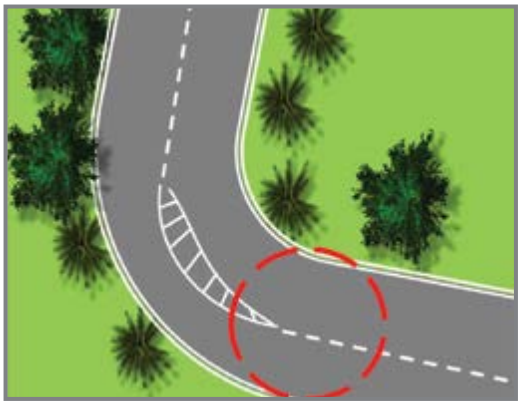


Figure 3.10 Warning lines with hatched marking

Interpretation (Warning lines):

You should get alert if you see a warning line. It indicates that hazardous condition is about to be encountered. The hatched markings indicate the exact location of the hazard within the carriageway.

3.3.1.5 Bus and Cycle Lane

The lanes reserved for buses are separated with a white line as bus lane marking on the road (Figure 3.11). The words “BUS LANE” are marked at the beginning of the lane and are repeated at each junction. If you enter into such a lane while driving any vehicle other than a bus, it will be considered as a violation of rules, and you will be penalised. Apart from a penalty, there are chances of the severe accident since the lane is meant for bus and bus driver might not expect other vehicles in the bus lane.

Similarly, cycle lane markings are provided when a portion of the road is designated for the bicyclists (Figure 3.12). Cycle lane markings consist of bicycle symbol painted on the road, which may also be supplemented by the words “CYCLE TRACKS”. Motorised vehicles should not enter into such cycle lanes.

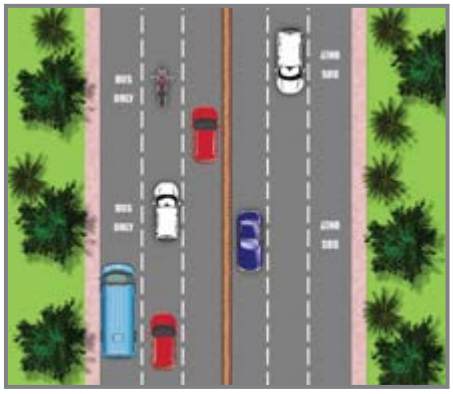


Figure 3.11 Bus lane markings

Figure 3.12 Cycle lane markings

Interpretation

(Bus and Cycle lanes)

Driver should not drive on lane marked as “BUS ONLY” or “CYCLE”. These lanes are meant exclusively for bus and cycles.

3.3.2 Border or Edge Lines

Border or edge lines can be seen along the sides of the roads or along the medians of divided carriageways (Figure 3.13). You should not cross these edge lines unless there is an emergency situation such as vehicle break down. The edge lines are provided at the edge of the road where the shoulder is paved and has a similar surface of that of the carriageway. The edge line indicates the line after which the shoulder starts and carriageway ends. The edge lines are also provided near the median of the divided carriageway, wherever there is a raised median, you should always drive keeping a safe distance from this edge lines so that your vehicle by any chance does not collide with the median.

For safety, you must drive keeping some distance from the edge lines and avoid swaying of your vehicle from the carriageway.

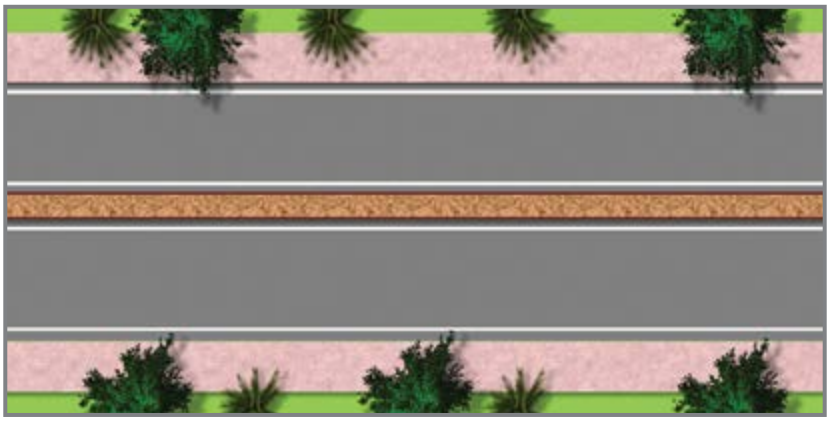


Figure 3.13 Border or edge line markings

3.3.3 Diagonal or Chevron Marking

Diagonal or chevron marking indicate the neutral area, and you should not drive on a marked portion of this road to avoid collision with kerb nose or the traffic on major roads (Figure 3.14).

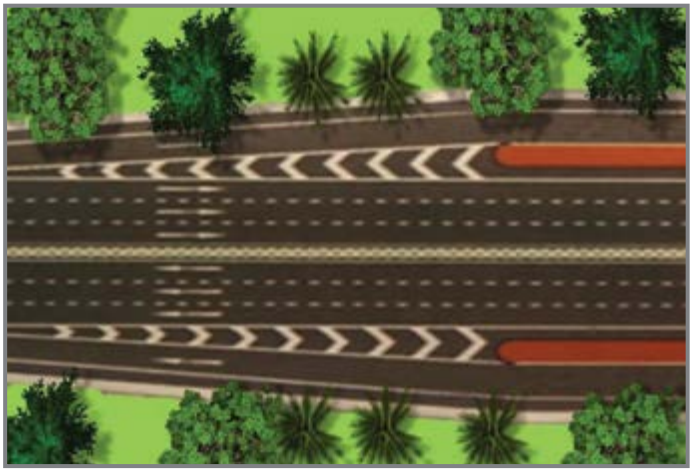


Figure 3.14 Chevron/diagonal marking

Interpretation (Chevron/Diagonal marking)

You must not drive on the chevron making. This marking indicates the neutral area before the kerb nose.

3.3.4 Intersection Marking

Different types of road markings are painted at or near an intersection to help you cross the intersection safely. The various types of markings you may see at or near an intersection are discussed below.

3.3.4.1 Stop Line

Stop line is painted across the roadway before an intersection to indicate the position before which you should stop your vehicle. Stop line can be a single white solid line or a double white solid line (Figure 3.15). The double line is supplemented by a stop sign and the word STOP painted on the road.

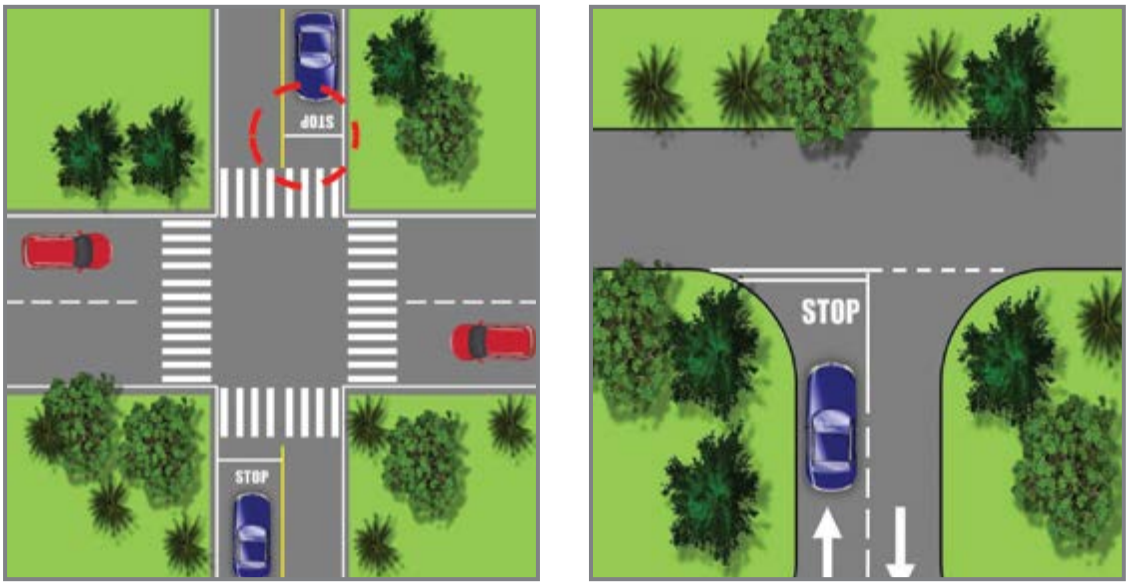


Figure 3.15 Stop line markings at intersection

Interpretation

(STOP line)

The vehicle must stop before the STOP line when the signal is RED or there is a STOP sign. Drivers may be penalized if they cross the stop line.

3.3.4.2 Give Way Lines

If you see a GIVE WAY line, along a minor road, you should give priority to vehicles on the major road. It consists of two parallel white broken lines (Figure 3.16). It is supplemented by a hollow inverted triangle and a “Give Way” sign. Such “Give Way” lines are generally provided at intersections without a traffic signal and also at entry points of the roundabouts.

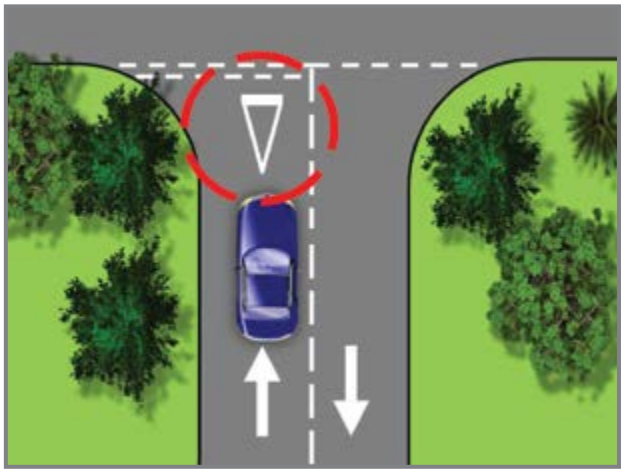


Figure 3.16 Give Way lines at intersection

Interpretation

(GIVE WAY line)

At “Give Way” line the driver should look for traffic on major road and cross the line only if safe gap is available.

3.3.4.3 Pedestrian Crossing

Pedestrian crossings or zebra crossings are provided in a location where pedestrians cross a roadway. You, as a driver, should stop your vehicle prior to the pedestrian crossing and allow pedestrians to cross safely. You, as a pedestrian, should always cross the road where pedestrian crossings are marked. Pedestrian crossings are provided at important intersections where conflicts exist between vehicles and pedestrians. At intersections, pedestrian crossings are preceded by a stop line. An example of an urban intersection with pedestrian crossings is shown in Figure 3.17.

Figure 3.17 Urban intersection with pedestrian crossing

Interpretation

(Pedestrian crossing)

Pedestrians should use demarcated crossing at intersections. Vehicles should stop at stop line preceding the pedestrian crossing at junctions for safety.

3.3.4.4 Cycle Track Crossing

Cycle track crossing is provided wherever a cycle track crosses a road. The marking for cycle track is drawn with two continuous white lines across the roadway. At the intersection, solid green lines are marked across the pavement to indicate cycle track crossing (Figure 3.18).The motorized driver should give priority to a bicyclist at intersections and should carefully cross the cycle track to avoid any collision with cycles.

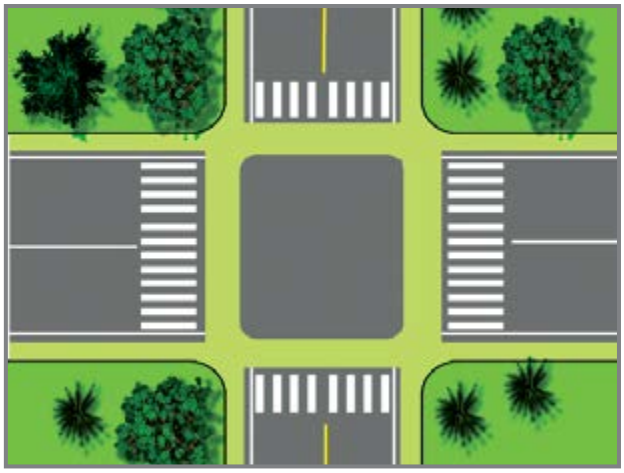


Figure 3.18 Urban intersection with cycle crossing

Interpretation

(Cycle track crossing)

Cyclist should use the dedicated cycle tracks at crossing to minimize conflicts with motorized vehicles.

3.3.4.5 Speed Change Lane

The speed change lanes give you an opportunity to increase or decrease the speed of vehicle while entering and leaving a major road. It is separated by an island with channelizing lines at the nose of the island to reduce collision probability (Figure 3.19).

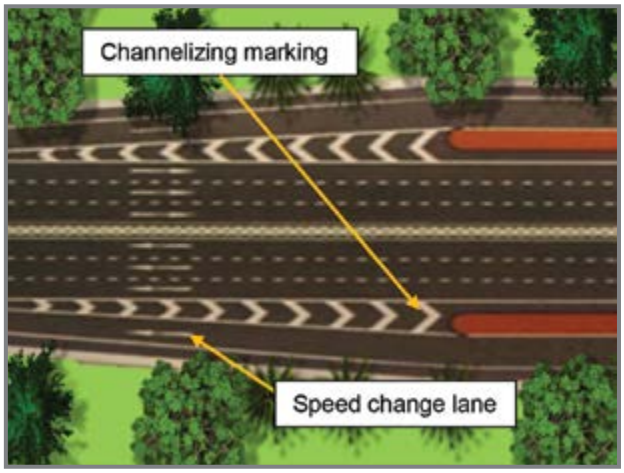


Figure 3.19 Speed change lane

Interpretation

(Speed change lanes)

Speed change lanes are used to accelerate or decelerate the vehicle entering or moving out of main stream traffic.

3.3.4.6 Directional Arrows

While approaching an intersection, you will have to decide which direction you want to take from the intersection. The directional arrows help you to make the decision beforehand for change in direction. The directional arrows are sometimes also supported by text for information (Figure 3.20).

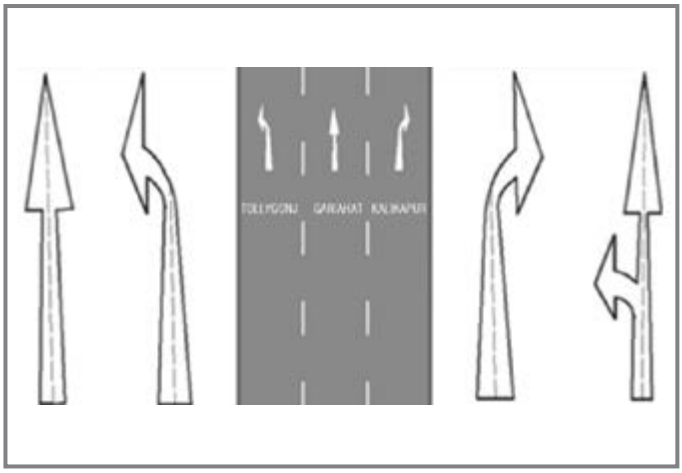


Figure 3.20 Directional arrows

Interpretation

(Directional arrow)

Drivers have to take a call for the direction they should head from the intersection with the help of the arrows.

3.3.4.7 Box Marking

At a few critical intersections, a box is marked with yellow crossed diagonal lines to indicate the area where your vehicle must not be stationary even for a short while (Figure 3.21). There can be a “KEEP CLEAR” word message for the intersection of minor significance instead of box marking.

Figure 3.21 Box marking at intersection

Interpretation

(Box marking)

The drivers should not stop in this area. The drivers should not enter box area even if there is green light if box area cannot be crossed completely.

3.3.5 Other Markings

3.3.5.1 Obstruction Approach

Sometimes, you, while driving, may face some physical obstructions within the roadway such as a monument, transmission poles or towers, trees, etc., which can create safety issues if you do not know about it beforehand. The immediate approach to such obstructions is marked with diagonal/chevron marking (Figure 3.22).

Figure 3.22 Obstruction approach marked with diagonal marking

Interpretation

(Obstruction marking)

Drivers should be careful when they encounter with diagonal/chevron marking. This marking indicates an obstruction on the road.

3.3.5.2 Railroad crossing

At railroad crossings, you should obey the stop line and stop before it. Before the crossing, there will be a series of strips of road marking which indicates the approach of the railroad crossing (Figure 3.23). You should not overtake any vehicle near the railroad crossing.

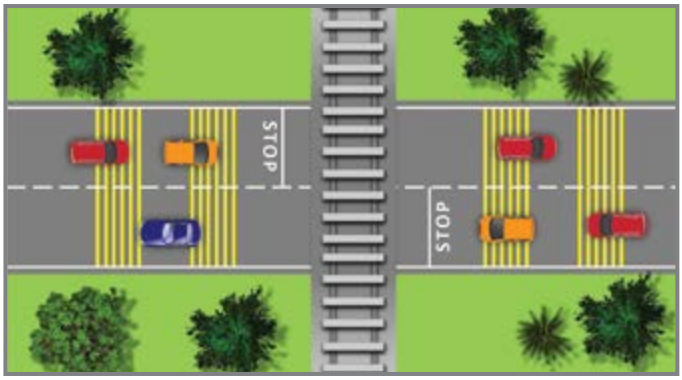


Figure 3.23 Markings at railroad crossing

Interpretation

(Rail road marking)

Drivers must stop before the stop line at the crossing. Drivers should not overtake vehicles at railroad crossing.

3.3.6 Parking

You require parking space for your vehicle once you reach your destination. There are designated spaces, with specific road markings, where you can park your vehicle. These spaces can be parallel to the road, along with the kerb, or at an angle. Some parking spaces are particularly meant for the certain type of vehicles. Such parking spaces are often indicated by text on the road like “TAXI”, “CAR”, etc. Such parking spots should only be used by the vehicles that are allowed to be parked at these spots. Different types of parking are shown in Figure 3.24 to Figure 3.26.

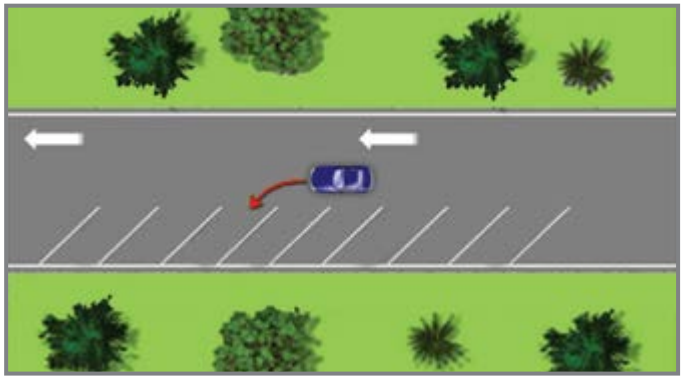


Figure 3.24 Markings for angle parking

Interpretation

(Parking marking)

You must park the vehicles at designated parking places. The figure shows angle parking.

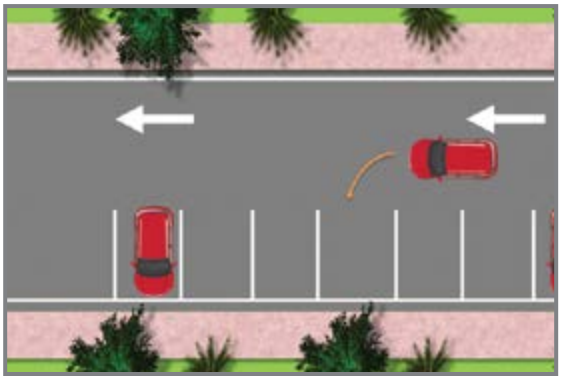


Figure 3.25 Marking for perpendicular parking

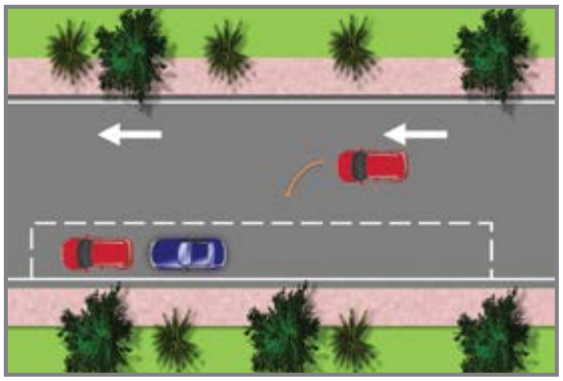


Figure 3.26 Marking for parallel parking

3.3.6.1 Bus Stop

Buses stopped at designated locations to pick up and drop off passengers. These locations are marked by broken white lines and can be recognized by the words “BUS STOP”(Figure 3.27). You as a driver should be aware of bus stop locations and should not park or stop your vehicle at such locations.

Figure 3.27 Bus stop marking

Interpretation

(Bus stop marking)

Only bus can stop at this location. Drivers should not park their vehicles at kerb near bus stops.

3.4 Recent Developments

One of the new developments in road markings is Three Dimension (3D) marking. These markings create a virtual 3D image so that you remain extra cautious while driving. This type of marking is expected near the place of the pedestrian crossing to enhance the safety of pedestrians. As shown in Figure 3.28, the 3D marking is used for pedestrian crossing so that a driver reduces the speed of the vehicle near the pedestrian crossing.

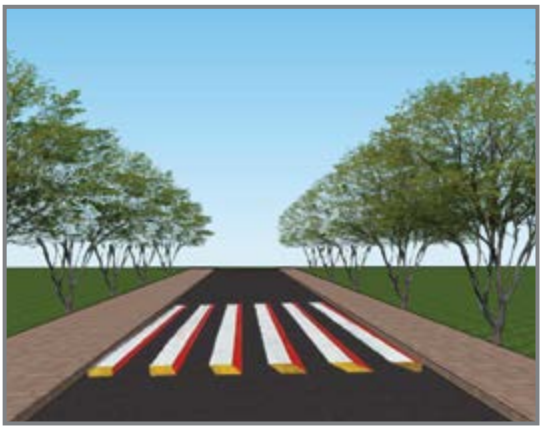


Figure 3.28 An example of 3D marking

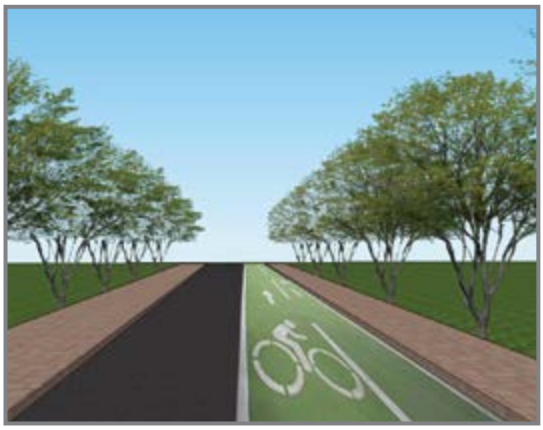


Figure 3.29 An example of cycle lane marking using green colour

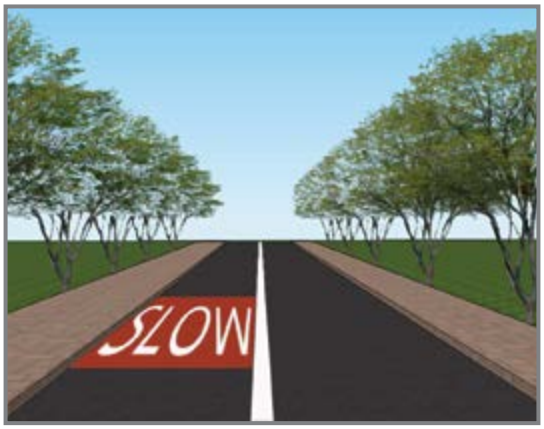
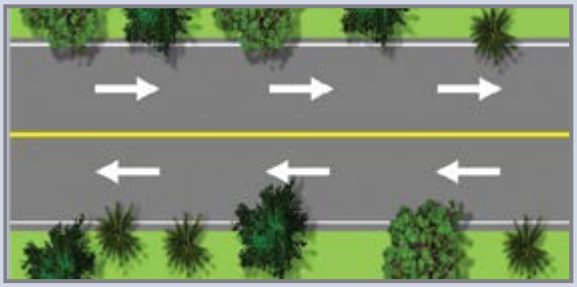


Figure 3.30 Example of warning vehicles to reduce speed using red colour marking

New colours like blue, green and red have been recommended by new guideline IRC 35:2015. Drivers might encounter such new colours soon. Each colour has certain significance and drivers must act accordingly. For example, Figure 3.29 shows cycle track using green colour and Figure 3.30 shows marking in red colour to warn the vehicles to reduce their speed.

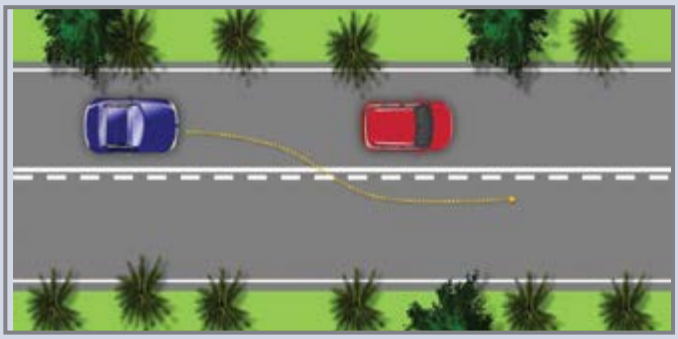
3.5 Exercise Questions

1. What does the yellow line in the picture indicate?



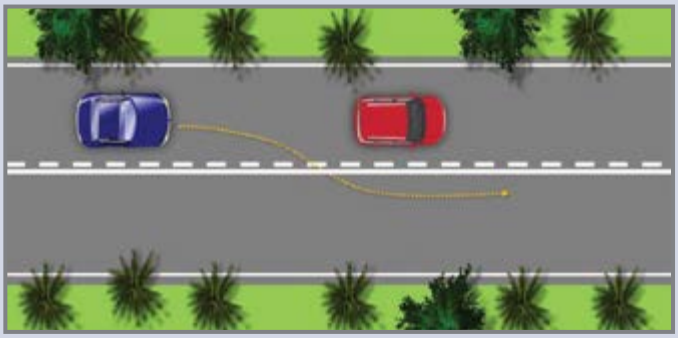
a) Overtaking allowed
b) Parking marking
c) Overtaking prohibited
d) Bus lane

2. Can the blue car overtake the red car in the following condition?



a) Yes
b) No

3. Can the blue car overtake the red car in the following condition?



a) Yes
b) No

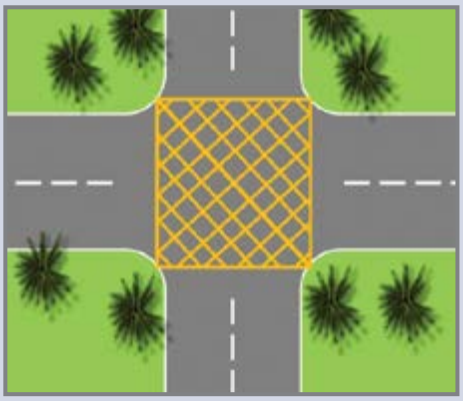
4. What is the use of double solid line as shown below?

a) To indicate overtaking zone
b) To indicate speeding up zone
c) To indicate no overtaking zone
d) To indicate parking facility nearby

5. Which of the following indicates Give Way?

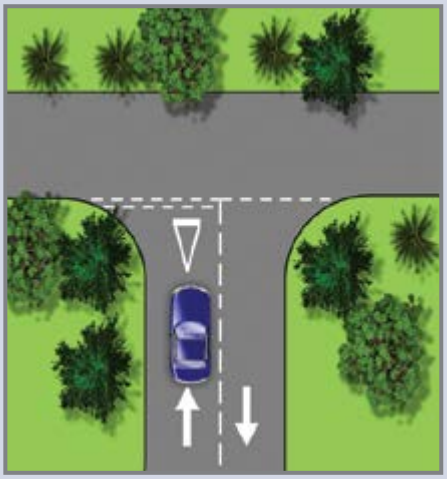
a) Double solid line
b) Double broken line
c) Single broken line
d) Hatched

6. What does yellow box in the middle of an intersection indicate?



a) Parking
b) Keep clear
c) Bus only area
d) Pedestrian crossing

7. The triangle marking before the intersection indicate_____



a) STOP
b) Give Way
c) Park
d) None of the above.

8. What does the chevron marking indicate in the figure below?

a) Parking area
b) Kerb approach
c) Bus stop
d) None of the above

9. What does an edge line indicate?

a) Line separating opposite traffic
b) Line indicating end of parking zone
c) Line indicating end of carriageway
d) None of the above

10. Which of the following colour is used for indicating public transport lane?

a) White
b) Yellow
c) Blue
d) Red

CHAPTER 4

Rules For Safe Driving

Bhargab Maitra,
Munavar Fairooz Cheranchery
&
Prashant Prasad

4.1 Background

The prime responsibility of a driver is to drive the vehicle carefully and prudently to avoid an accident. Hence, it is important for a driver to know various rules of the road and drive accordingly to create a safe road environment for himself/herself and other road users, including pedestrians, cyclists, and other motorists. The rules of road generally vary with respect to road conditions, environmental conditions, road types, etc. Such variations in the rules will be discussed in detail in other chapters. The present Chapter aims to discuss general rules/guidelines to be followed during various manoeuvres, challenging situations, etc., which are essential for the drivers to learn from road safety point of view.

A safe road environment for the driver and other road users can be ensured by knowing road rules related to the following.

- Blind Spot
- Lane selection
- Parking of vehicle
- Overtaking
- Turning manoeuvre
- Intersection
- Railway Crossing
- No Stopping Zones
- Hand Signal
- Use of Light
- Use of Horn
- One-way Road
- Vehicle alteration/modification
- Riding on Running Board
- Resoled Tires
- Vehicle Specific safe driving
- Common unsafe practices

A detailed discussion on the above topics is included in the subsequent sections.

4.2 General Guidelines

The following guidelines need to be followed in every occasion of driving regardless of the context and the type of vehicle.

a) Pre-driving: The first and foremost task is to maintain the vehicle properly at regular intervals as suggested by the manufacturer of the vehicle. This will help you to keep the vehicle in good working condition and reduce the risk of accidents due to mechanical failure of the vehicle. It is also important to regularly check the following.

- Engine oil, break oil and fuel level
- Coolant level
- Condition of tyre
- Brakes
- Lights
- Horn
- Wiper and wiper fluid
- Ammeter

b) You should follow the speed limit.

c) Slow down your vehicle while negotiating a curve.

d) Do not use a mobile phone while riding as it distracts your attention.

e) You should maintain a safe distance from other vehicles. The safe distance may also be expressed in terms of time required to stop the vehicle safely. While following a vehicle, always maintain a safe distance which can be covered in 2 seconds or more. This is called **2-Second rule**. During adverse weather conditions (say, fog or heavy rain), the time corresponding to a safe distance may be 9 seconds or more. Figure 4.1 presents a schematic image of 2-Second rules for different speeds. It is clear from the figure that as the speed increases the safe distance required to maintain between your vehicle and the vehicle ahead also increases.

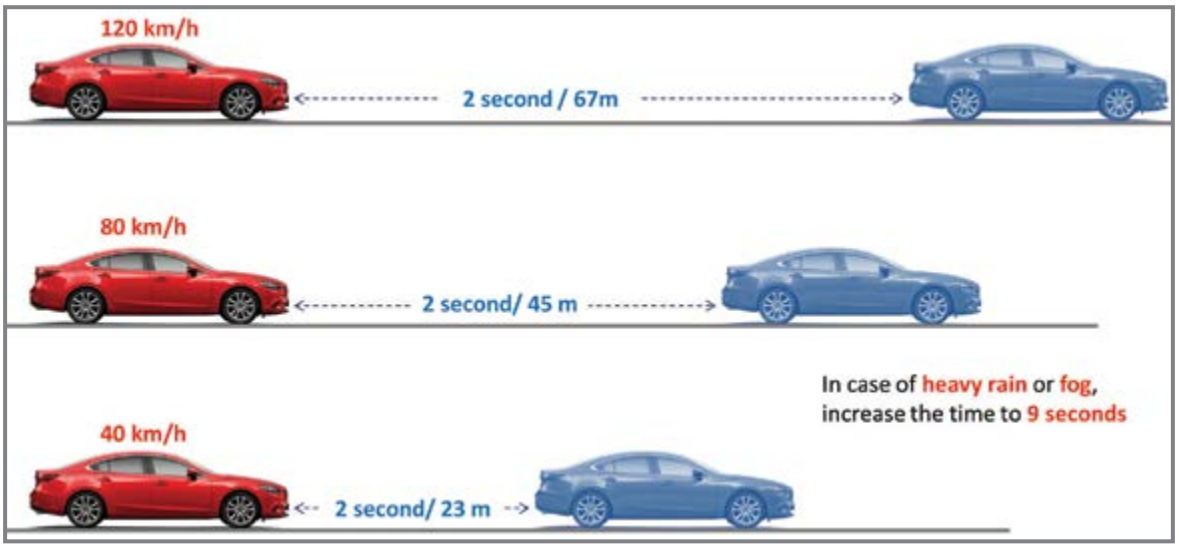


Figure 4.1 Safe driving distance: 2-Second rule

f) Give way to traffic on your right when both roads have equal priority.

4.3 Blind Spot

The blind spot is one of the most important aspects you should know prior to driving. The blind spot is defined as an area around the vehicle which is not directly visible to driver (Figure 4.2). When you are crossing a road or taking a right turn, with a passenger on your left, you are blind to any approaching vehicles from your left, unless the co-passenger is positioned correctly. In general, it is believed that a driver can see all around the vehicle with the help of mirrors. However, there are areas around the vehicle which you cannot see even though you have mirrors in the vehicle. You should follow the guidelines given below to avoid the potential threat due to blind spot, and the same will be referred while explaining other rules of the road.

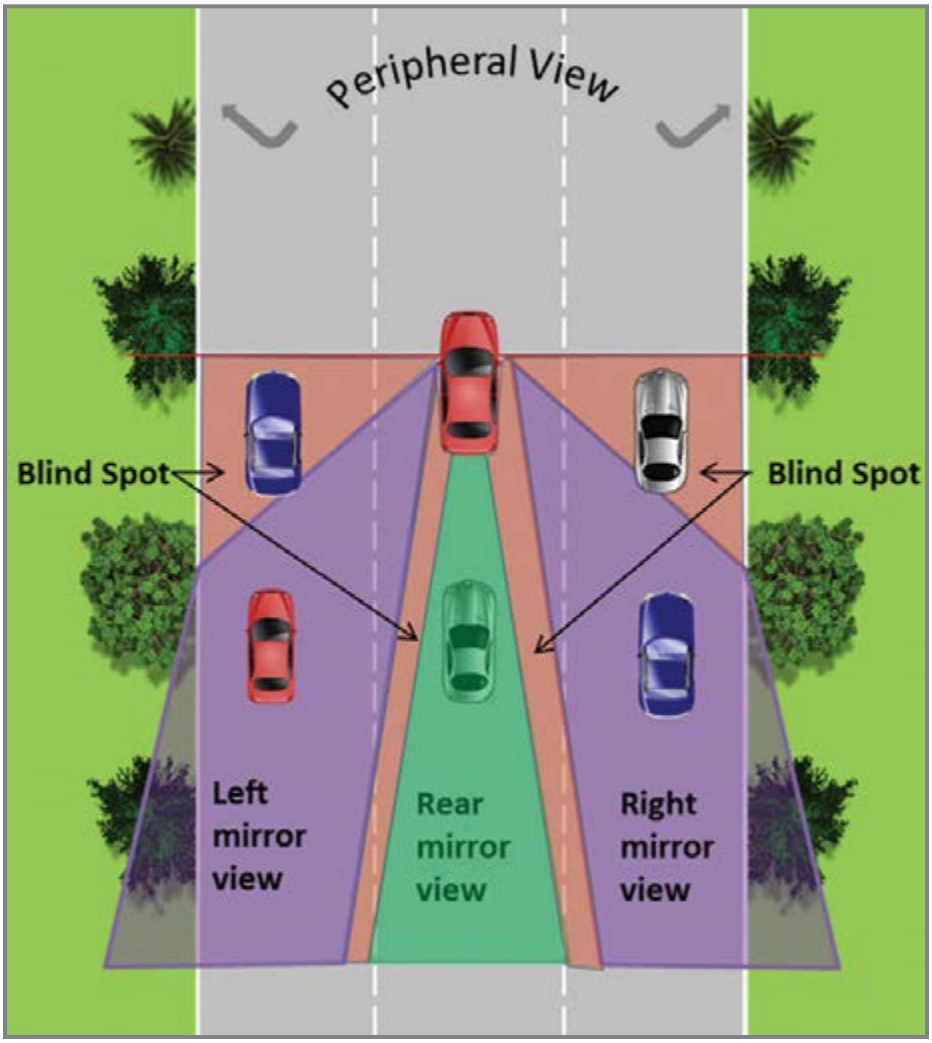


Figure 4.2 Blind spot around a vehicle

4.3.1 Guidelines to be followed to check for Vehicles in Blind Spot

In order to check for vehicles or pedestrians in the blind spot, you need to follow the guidelines given below.

a) To see blind spot at the left side, turn your head towards left until you are looking along your shoulder.

b) To see blind spot at the right side, turn your head towards the right until you are looking along your shoulder.

c) Double check for motorcyclists and bicyclists, more so during low light conditions, because they are less visible due to the relatively smaller size.

4.4 Lane Selection

Many roads have two or more lanes in one direction. Choosing an appropriate lane, while driving on a multilane road, is very crucial from the safety point of view. The section includes guidelines for lane selection, steps to be followed while changing the lane, and guidelines to be followed at slip lane.

4.4.1 Guidelines for Lane Selection

a) Always keep your vehicle to the left.

b) Position your vehicle to keep up with the traffic flow.

c) On a multi-lane divided highway, it is important to keep the extreme right lane free for overtaking and emergency vehicles (Figure 4.3). You may occupy the extreme right lane only while overtaking another vehicle, but then you should return to the adjacent left lane safely. You must not continue to drive in the extreme right lane keeping your left lane free.

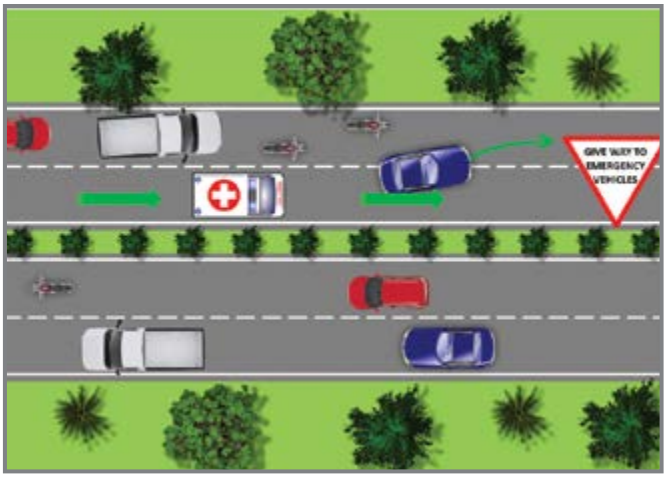


Figure 4.3 An example of lane selection

d) Lane changing is important prior to a turning manoeuvre. For instance, while turning left, move your vehicle to the left and give left turning signal. On the other hand, while turning right, move to the right and give right turning signal.

e) You should not change lane without having a suitable gap to merge (Figure 4.4). Otherwise, it may lead to conflicts and road blockage.

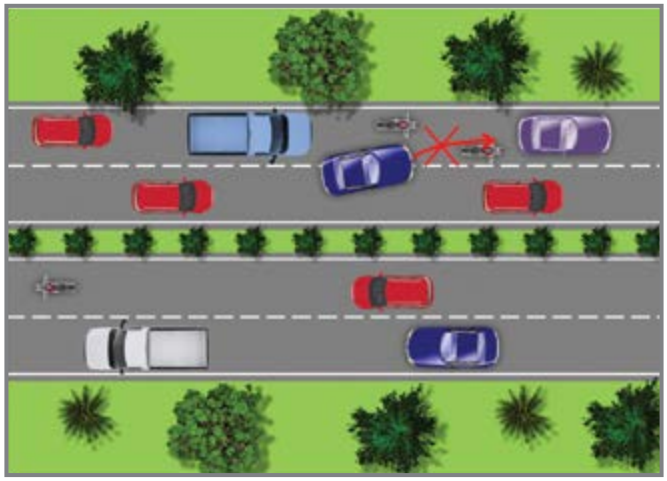


Figure 4.4 An example of changing lane without suitable gap

f) You should not change lanes frequently.

g) You should not change several lanes at a time.

4.4.2 Steps to be followed while changing lane

The following are various steps you need to follow while changing lane to the right on a multi-lane road (Figure 4.5).

a) Check the mirrors for the suitable gap. This is to ensure that no other vehicle is trying to overtake your vehicle and there is sufficient gap available for you to occupy the right lane.

b) Look over your right shoulder (checking for vehicle in the blind spot as discussed in Section 4.3) and give right turning signal.

c) Check again through the mirror and over your shoulder before making the lane change. This is to make sure that there is sufficient gap just prior to the lane changing.

d) Change the lane gradually.

e) After changing the lane, you should make sure that the indicator is turned off.

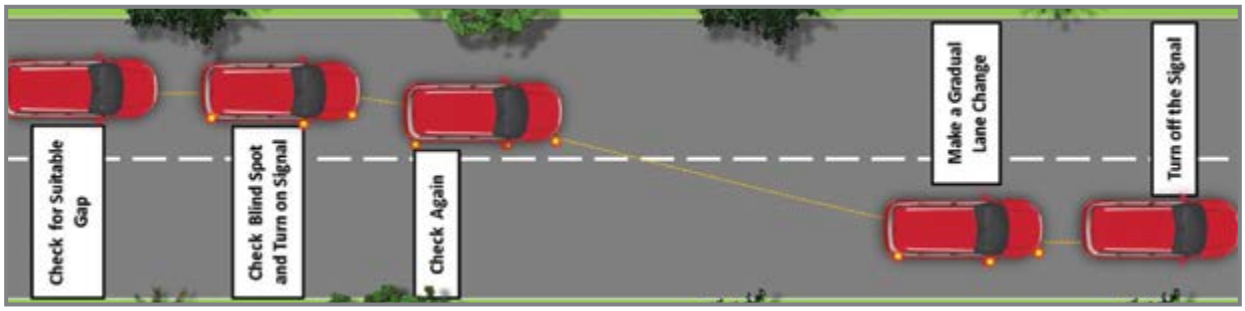


Figure 4.5 Various steps of lane changing

4.4.3 Guidelines for Slip lane

Slip lane is provided at intersections to take a free left turn unless specifically mentioned "NO FREE LEFT". In a simple intersection, left turn is always taken irrespective of the signal. However, in a complicated intersection with heavy straight traffic from the right direction, separate Turning Phase is provided for left turn. The slip lane is generally adjacent to a traffic island (Figure 4.6). The guidelines to be followed at slip lanes are given below.

a) You should not stop or park at slip lanes unless there are signs to indicate that parking is allowed.

b) You should not block slip lane if you are trying to go straight or right.

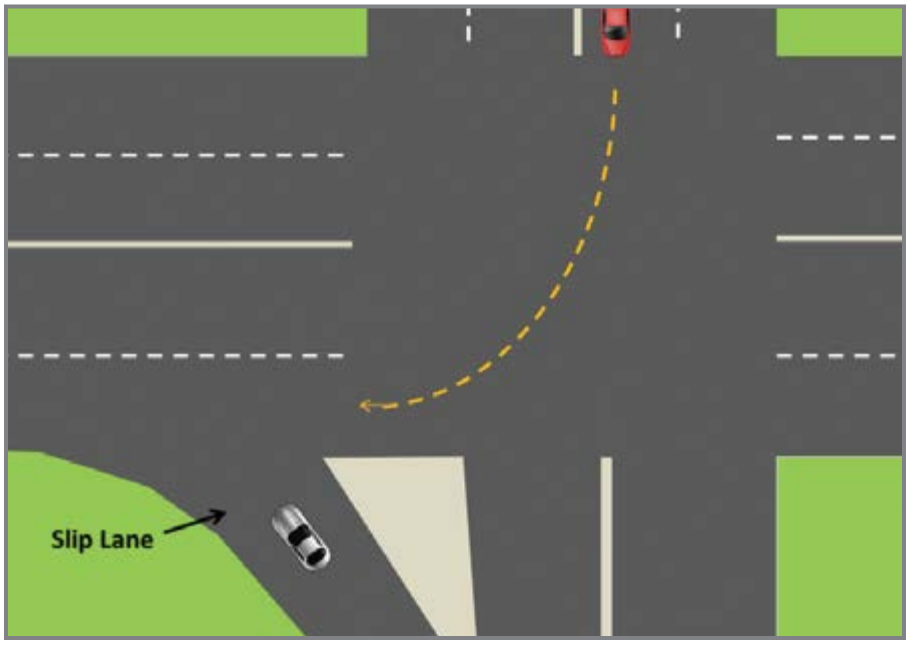


Figure 4.6 A typical view of slip lane

4.5 Parking

Parking your vehicle at designated place is very important. Otherwise, it may lead to traffic interference and thereby cause delay or pose a danger to other vehicles. Therefore, it is important to learn the know-hows of parking the vehicle, how to take the vehicle out from the parking lot, which are the restricted areas from parking, etc. These aspects related to the parking are discussed below.

4.5.1 General Guidelines for Parking

a) Do not park your vehicle within 20m before and 10m after a Bus Stop (Figure 4.7). Parking the vehicle within this restricted area will obstruct smooth merging and diverging manoeuvre of buses at bus stops. This may also cause inconvenience to the passengers while boarding and alighting the bus.

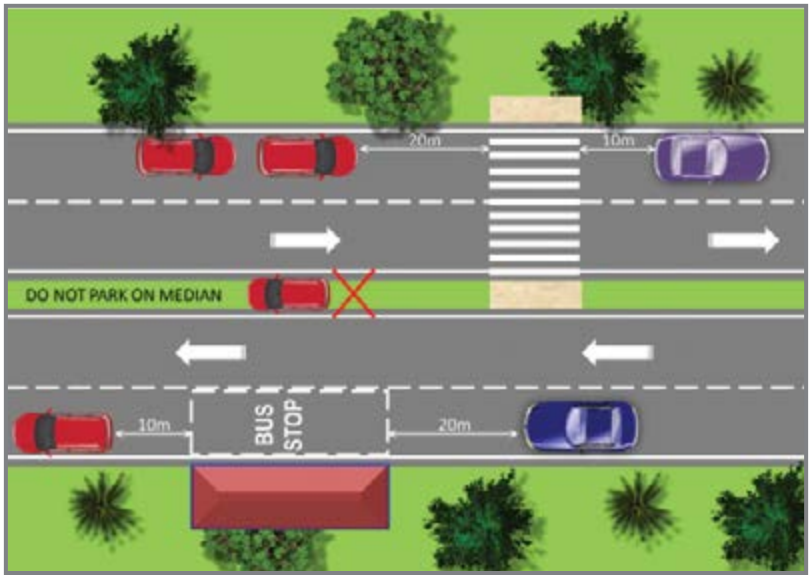


Figure 4.7 Parking restrictions near bus stop and on median

b) Do not park your vehicle within 20m before and 10m after Pedestrian Crossing (Figure 4.7). Parking the vehicle within this restricted area will cause inconvenience to pedestrians while crossing the road. This may also obstruct the sight distance of the pedestrians and approaching vehicle. You as a driver should be extra cautious when overtaking a parked vehicle near a pedestrian crossing.

c) Do not park your vehicle within 30m of an at-grade intersection unless a sign allows you to park there (Figure 4.8). Parking the vehicle within this restricted area will cause inconvenience to the turning vehicles as they are supposed to change the lane at least 30m prior to the intersection.

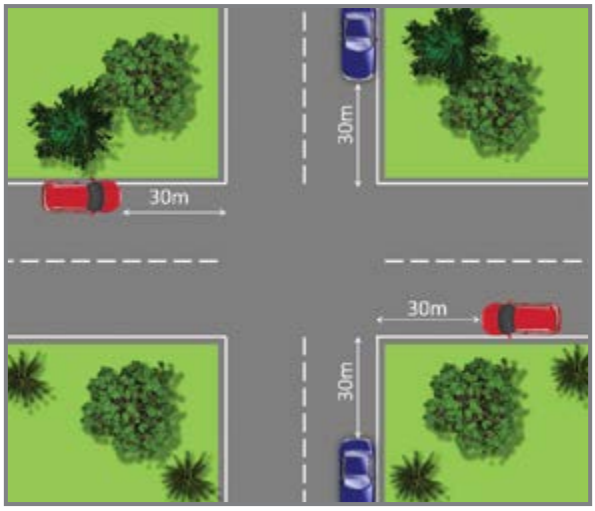


Figure 4.8 Parking restrictions near intersection

d) Do not park your vehicle within 20m of a railway crossing (Figure 4.9). This is because maintaining a safe distance from the moving train is important. Also, long queue and congestion are expected at a railway crossing. Parking the vehicle within this restricted area will further increase congestion and inconvenience to other vehicles.

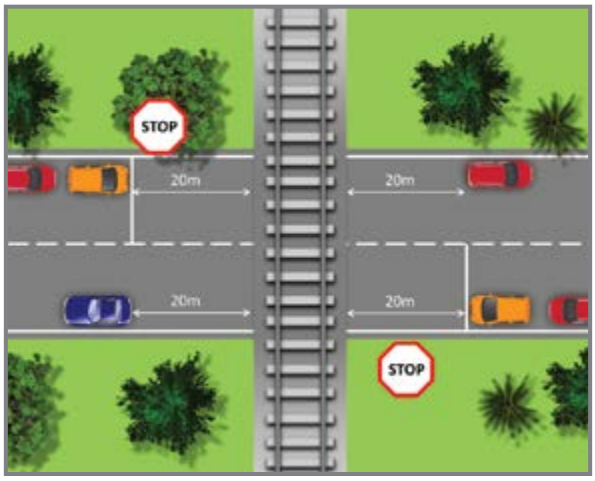


Figure 4.9 Parking restrictions near railway crossing

e) Do not park your vehicle on the top of a vertical curve. Sometimes, sight distance to the approaching vehicle is not adequate to the top of the vertical curve.

f) Do not park your vehicle within 30m of a Fire Station to ensure fast and easy exit of Fire Tenders.

g) Do not park your vehicle on the main road or on a road with heavy traffic as it may interfere with the traffic flow and thereby cause delay or pose a danger to other vehicles.

h) Do not park your vehicle near a hospital entrance as, otherwise, it may cause inconvenience to the vehicles, especially the emergency vehicle, to enter/exit the hospital.

i) Do not park your vehicle right next to a traffic sign thereby obstructing the visibility towards signs.

j) Do not park your vehicle within 1.5m on either side of a driveway (Figure 4.10). Parking the vehicle within this restricted area will cause inconvenience to other vehicle while accessing the driveway.

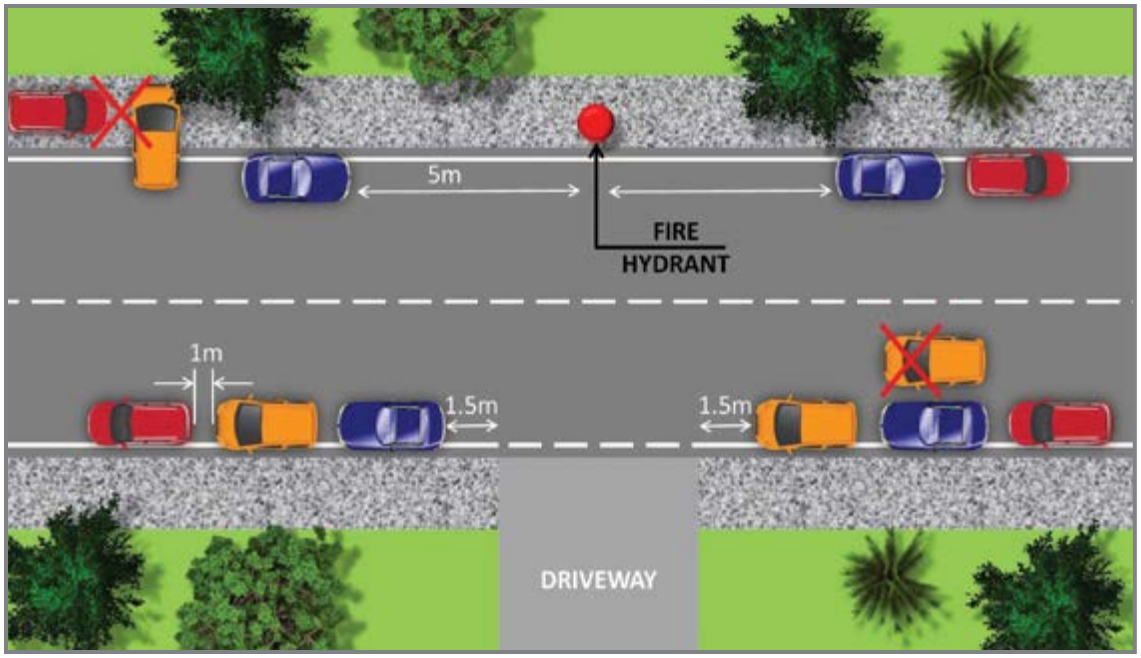


Figure 4.10 Parking restrictions near driveway, fire hydrant, and sidewalk

k) Do not park your vehicle within 5m on either side of the fire hydrant (Figure 4.10). Parking the vehicle in front of the fire hydrant will cause inconvenience to access the fire hydrant during an emergency.

l) Do not park your vehicle on sidewalks as it may cause inconvenience to pedestrians (Figure 4.11). This may also force the pedestrians to use the main road for walking and may lead to conflicts/accidents.

m) Do not park your vehicle on medians (Figure 4.7).

Figure 4.11 Examples of improper parking

4.5.2 Guidelines for Parallel Parking

Parallel parking is the usual way of parking unless the signage tells otherwise. The following are the guidelines for parallel parking.

a) Park your vehicle in the same direction as that of the adjacent traffic, parallel, and as much near to the kerb as possible, so that minimum obstruction is caused to the mainstream traffic due to the parked vehicle.

b) The parked vehicle should be entirely within the marking lines of vehicle parking (if any).

c) You should maintain at least one meter distance from any other parked vehicle (Figure 4.12). This distance between the vehicles will help you to take the vehicle out from the parking lot safely.

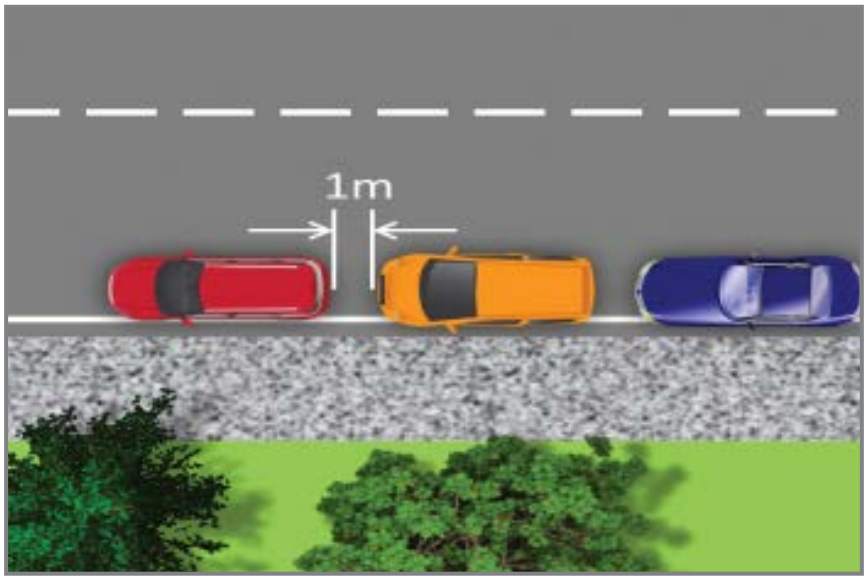


Figure 4.12 An example of parallel parking

d) Do not park your vehicle adjacent to a parked vehicle obstructing the carriageway (Double parking) (Figure 4.13).

Figure 4.13 An example of double parking

4.5.3 Guidelines for Angle Parking

Angle parking should be done only when the signage or the marking lines indicate it. Otherwise, as mentioned in the previous section, you need to do parallel parking. The following are the guidelines for Angle Parking.

a) Always park the vehicle at an angle of 45 degrees unless the angle is specified (say, 30 degrees, 60 degrees, etc.)(Figure 4.14).

b) Always park the vehicle in the same direction as shown on the sign board/ road marking.

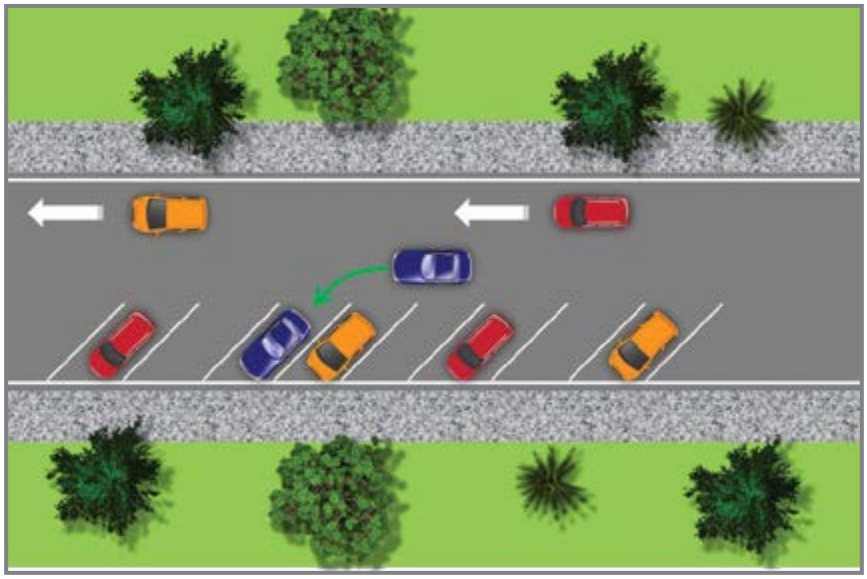


Figure 4.14 An example of angle parking

4.5.4 Things to Remember

After parking your vehicle at designated place, you need to follow the guidelines given below.

a) After parking the vehicle, before opening the door, check your mirrors and blind spots for pedestrians, bicycles or other vehicle.

b) Do not leave children alone in a parked vehicle.

c) Do not leave your pets in a parked vehicle.

d) Before leaving your parked vehicle, you must ensure that you have applied the hand brake. When parking on uphill or downhill, you should also make sure that the vehicle is engaged in first or reverse gear. For automatic transmission vehicle, put the vehicle in parking mode.

When the vehicle is parked on uphill or downhill section of a kerbed road, be sure that the front wheels are turned in such a manner that if the vehicle starts rolling, it gets arrested by the kerb.

e) If you are outside your parked vehicle, you should remove the key out of the ignition slot. It is also important to lock all doors and windows if nobody is left inside the vehicle.

f) Before moving the vehicle from a stationary position, you must signal for at least five seconds, check mirrors and blind spots.

4.6 Overtaking

Overtaking is often considered as a risky manoeuvre as it involves exposing the vehicle to the traffic from the opposite direction at high speed, on an undivided road. Therefore, it is important for you to know the step by step procedure for overtaking a vehicle in front of you. The following are the steps for performing a safe overtaking manoeuvre (Figure 4.15).

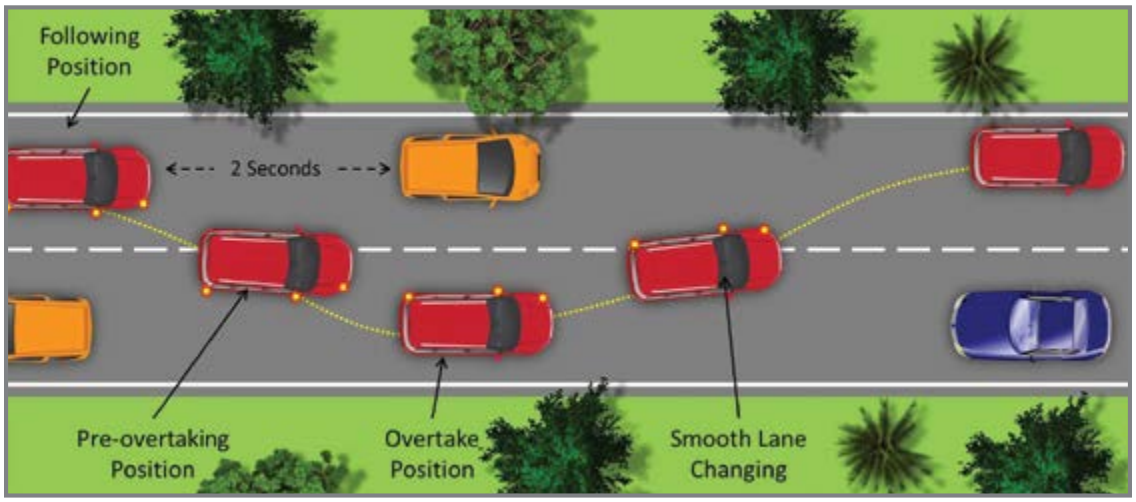


Figure 4.15 Steps for overtaking

a) Look through the mirrors to ensure no vehicle is overtaking your vehicle or any other vehicle, in the same direction.

b) Look over the right shoulder to ensure no vehicles are hidden in the blind spot.

c) Leaving a suitable gap in front of your vehicle, move towards the right side and ensure the suitable gap is available for overtaking.

d) Look through the right side mirror to ensure no vehicle is coming in the right lane, and turn the right turning signal on.

e) Occupy the right lane and accelerate to pass the vehicle you are overtaking.

f) Look through the left side mirror to see the position of overtaken vehicle.

g) Once you are at a safe distance ahead of the overtaken vehicle, turn the left turning signal on and gradually occupy the left lane.

h) After changing the lane, make sure that the turning indicator is switched off.

4.6.1 Guidelines for Overtaking

a) Do not accelerate while being overtaken as this will take more time for the overtaking vehicle to pass you, and therefore, it may be dangerous for both the vehicles.

b) When being overtaken, keep to the left to give adequate lateral space to the overtaking vehicle.

c) Do not obstruct the view of the overtaken vehicle while overtaking

d) Never overtake a vehicle from its left side.

e) Never overtake a vehicle near a pedestrian crossing.

f) Never overtake a vehicle when “No Overtaking” sign is given.

4.7 Turning Manoeuvre

This section deals with the guidelines to be followed while performing a turning manoeuvre. It includes the guidelines for left and right turning manoeuvres.

4.7.1 Guidelines for Turning Left

a) If there is no queue, then occupy the left lane at least 30m before the turning. If there is a queue (especially at intersections), then occupy the left turning lane well in advance before joining the queue (Figure 4.16).

b) You should not bypass the queue and force the vehicle into the queue as this may cause inconvenience to other vehicle and is also an unsafe practice.

c) Ensure that the turning path is clear and no one is coming up behind your vehicle on your left side.

d) Give the left turning signal.

e) After completing the turn, slowly and smoothly merge your vehicle with the traffic.

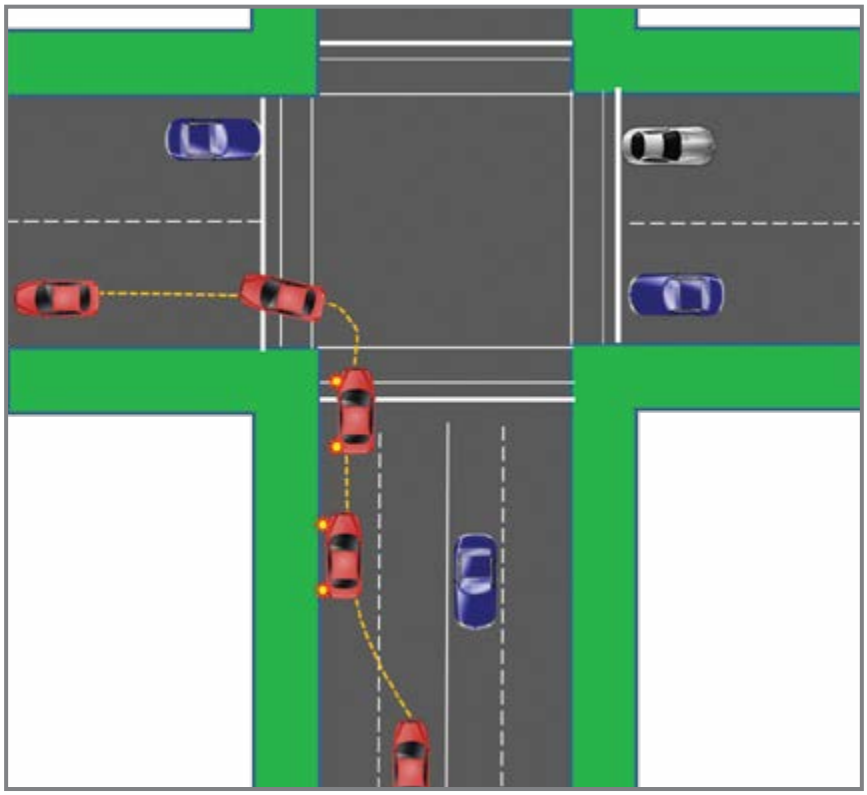


Figure 4.16 Guidelines for turning left

4.7.2 Guidelines for Turning Right

a) Look through the rear mirror and make sure that the traffic behind your vehicle is at a safe distance.

b) Give the right turning signal by hand or indicator and gradually slow down (Figure 4.17).

c) Leave as much room as possible for other vehicles to pass on your left.

d) As soon as you find a suitable gap, make the right turn.

e) Slowly and smoothly merge with the mainstream traffic after completing the right turn.

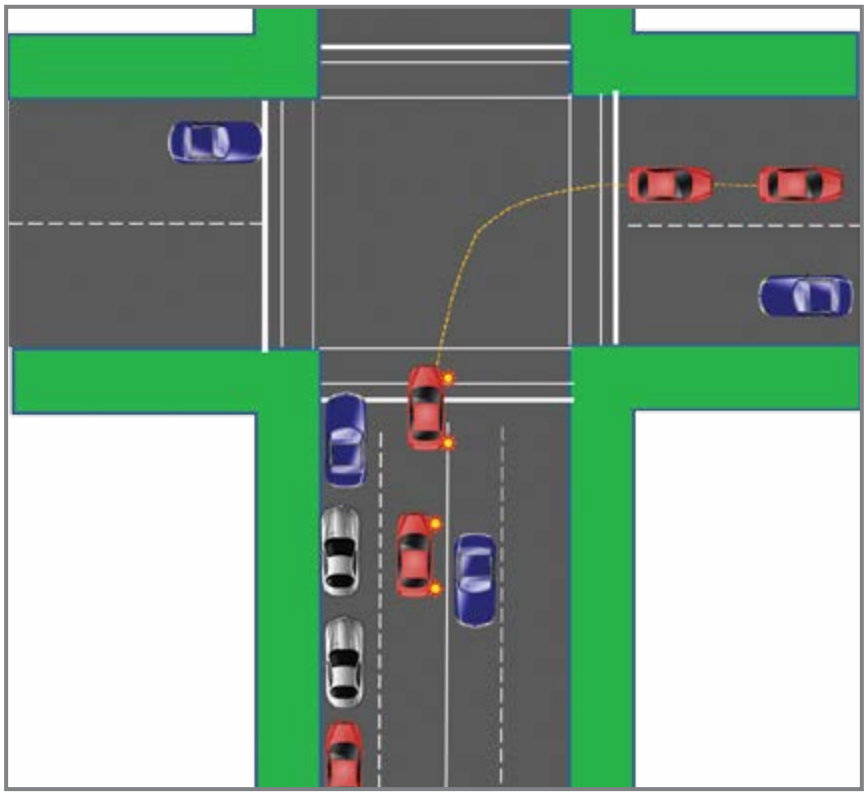


Figure 4.17 Guidelines for turning right

4.8 Intersection

This section deals with traffic lights, general guidelines to be followed at intersections, the right of way, and some specific guidelines to be followed at roundabouts.

4.8.1 Traffic Lights

Traffic lights are provided to control the traffic at intersections. As a driver, it is important for you to know different types of signal lights and follow the signals accordingly to ensure safety at intersections.

Red Light (Figure 4.18)

a) You should stop your vehicle when traffic light shows a red signal.

b) Stop your vehicle well before stop line.

c) Stop your vehicle in the same lane you intended to follow and do not shift to another lane to get ahead of traffic.

Figure 4.18 Red light

Amber Light (Figure 4.19)

If amber light appears after green light then you should follow the instructions given below.

a) Amber light gives time to clear the intersection if you have crossed the stop line. In such situation, you should not panic or increase the speed of the vehicle.

b) If you are behind the stop line, you should stop your vehicle when amber traffic light is indicated.

Figure 4.19 Amber light

If amber light appears after red light then start the vehicle engine and wait for the green light. You must not proceed until you see the green light.

Green Light (Figure 4.20)

a) You should move smoothly when traffic light shows a green signal.

b) Do not tear through traffic on seeing green light.

Figure 4.20 Green light

Flashing Red Light

a) When there is only continuous flashing red, not green or red and regular signal operation is not continued at a traffic signal, then this sign is equivalent to a STOP sign.

b) When traffic light shows a flashing red light, you should come to a full stop and may proceed only when the road is safe and clear.

Flashing Yellow Light

a) When traffic light shows a flashing amber light, slowing down is mandatory but stopping is not mandatory. You should slow down the vehicle and move carefully when you see a flashing amber/yellow light.

4.8.2 General Guidelines at Intersections

a) Slow down the vehicle while approaching an intersection.

b) Always stop your vehicle well before stop line.

c) Choose the turning lane (say, the left lane for turning left) at least 30m in advance.

d) Give proper indication (turning indicator or hand signal) before you turn.

e) Do not change lane immediately after giving turning signal. It is important to wait for five seconds so that the vehicles behind you can understand your intention.

f) Always give way to vehicles and pedestrians on the road that you are entering.

g) Do not cut the corner at the intersection (Figure 4.21).

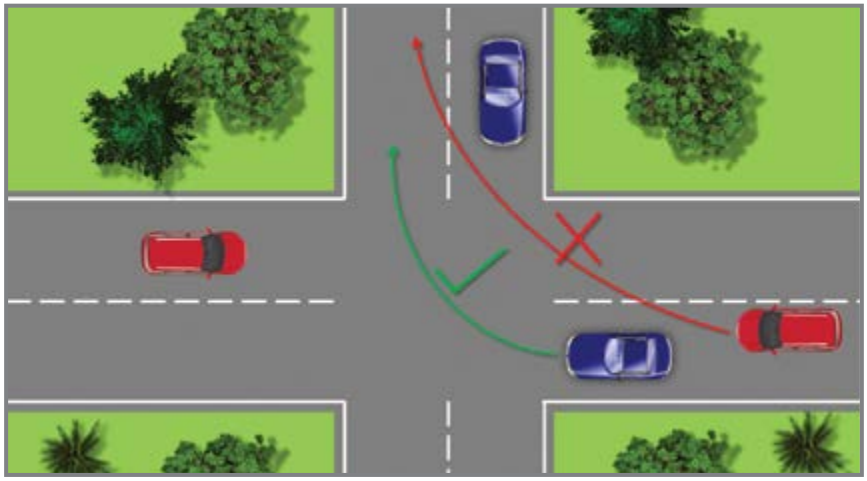


Figure 4.21 Do not cut the corner at intersection

h) Always stay alert and don't enter an intersection area if there is a chance of getting caught with a turning vehicle (Figure 4.22).

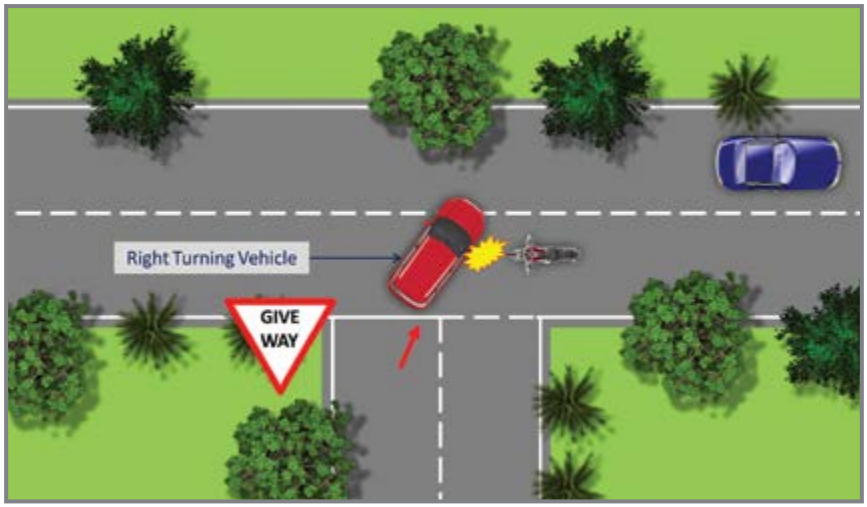


Figure 4.22 Unsafe manoeuvre at intersection

i) Avoid overtaking at intersections. Otherwise, it may lead to a collision with turning vehicle (Figure 4.23).

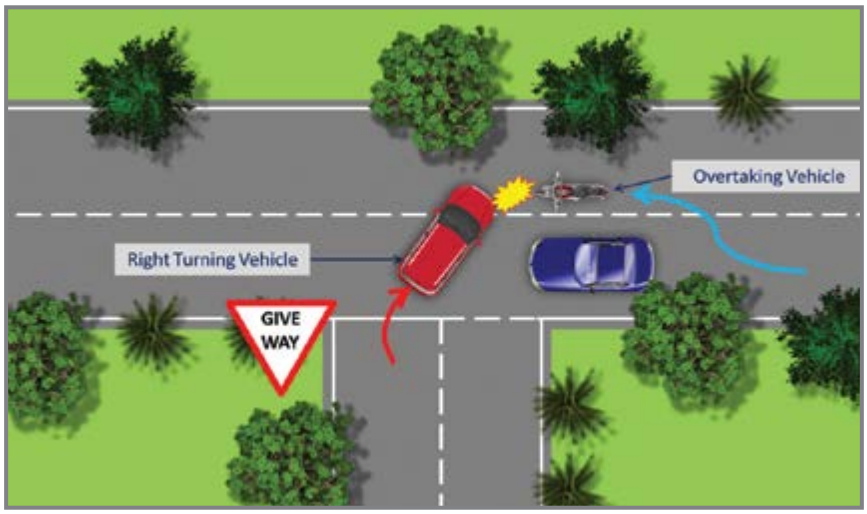


Figure 4.23 No overtaking at intersection

4.8.3 Right of way at Intersection

As a driver, it is important for you to know the right of way at intersections. In general, the priority of vehicle is defined based on sign or signal (at signalized intersections). If the intersection is controlled by signal or sign, then follow the priority as per the instructions. Otherwise, the vehicle approaching from the right side should get the priority to cross the intersection. Right of way based on Stop sign and Give Way sign are discussed below.

4.8.3.1 Right of way based on Stop Sign

Right of way based on Stop Sign at the intersection is illustrated in Figure 4.24. If the approach is controlled by a Stop sign, then you must stop your vehicle before the stop line (continuous line) and give priority to vehicles approaching from other directions.

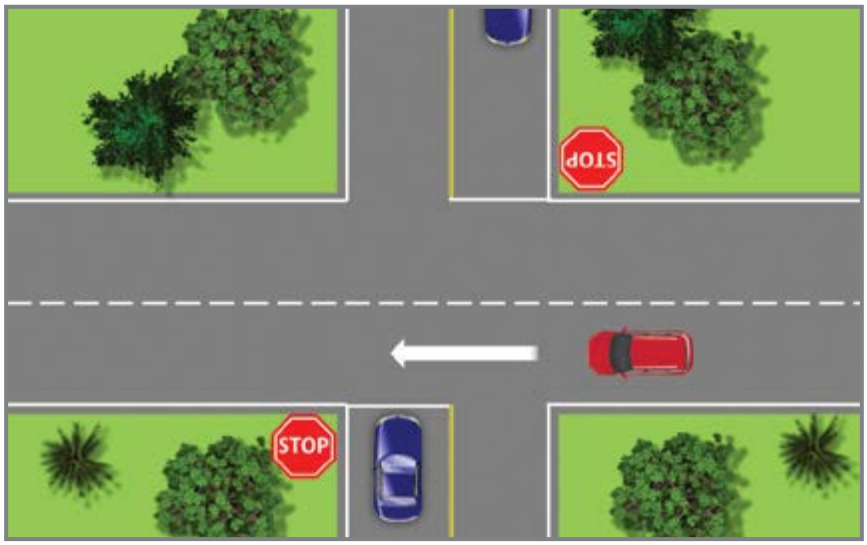


Figure 4.24 Right of way at intersection based on stop sign

4.8.3.2 Right of way based on Give Way Sign

Right of way based on Give Way sign is shown in Figure 4.25. If the approach is controlled by a Give Way sign, then you should give priority to vehicles approaching from major road. If sufficient gap is not available, then you must stop your vehicle and wait for a suitable gap keeping the priority in mind.

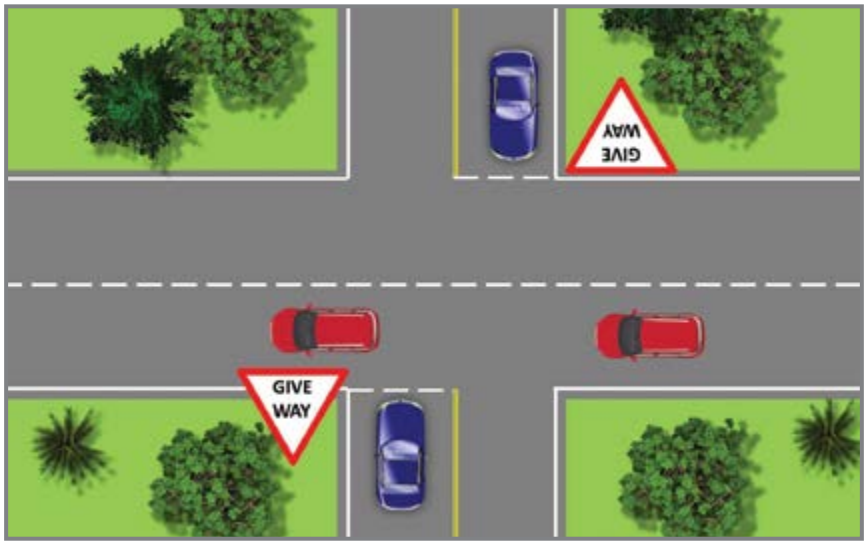


Figure 4.25 Right of way at intersection based on Give Way sign

4.8.4 Guidelines at Roundabouts

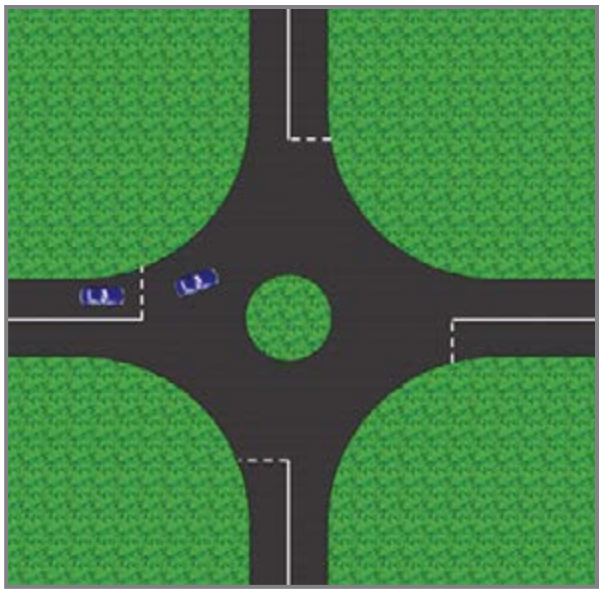
A roundabout is a type of circular intersection or junction in which road traffic flows continuously in clockwise direction around a central island. Besides the general guidelines to be followed at intersections, you need to follow the guidelines below.

a) Enter the roundabout at an angle (Figure 4.26a).

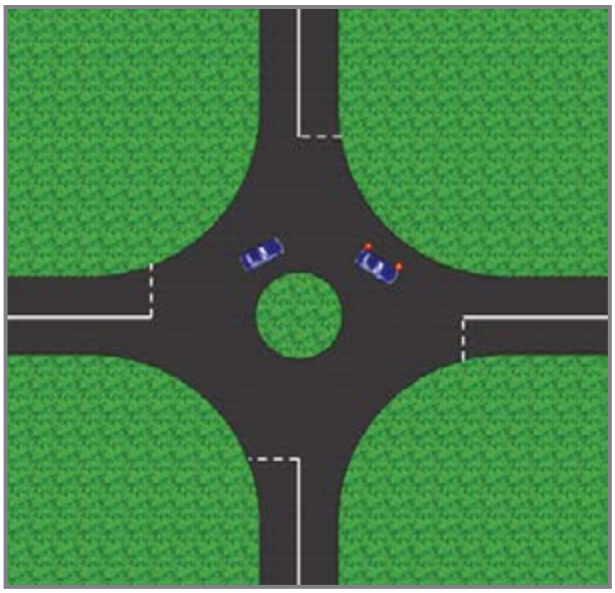
b) Merge slowly with the traffic inside the roundabout.

c) Give right turning indicator when not using an exit.

d) Give left turning signal while moving towards the exit (Figure 4.26b).



(a) Entering the roundabout at an angle



(b) Exiting the roundabout giving left turn signal

Figure 4.26 Safe practices for entry and exit at roundabout

e) Be watchful of a pedestrian or an animal that may appear suddenly.

f) Give way to the vehicles already using the roundabout (Figure 4.27).

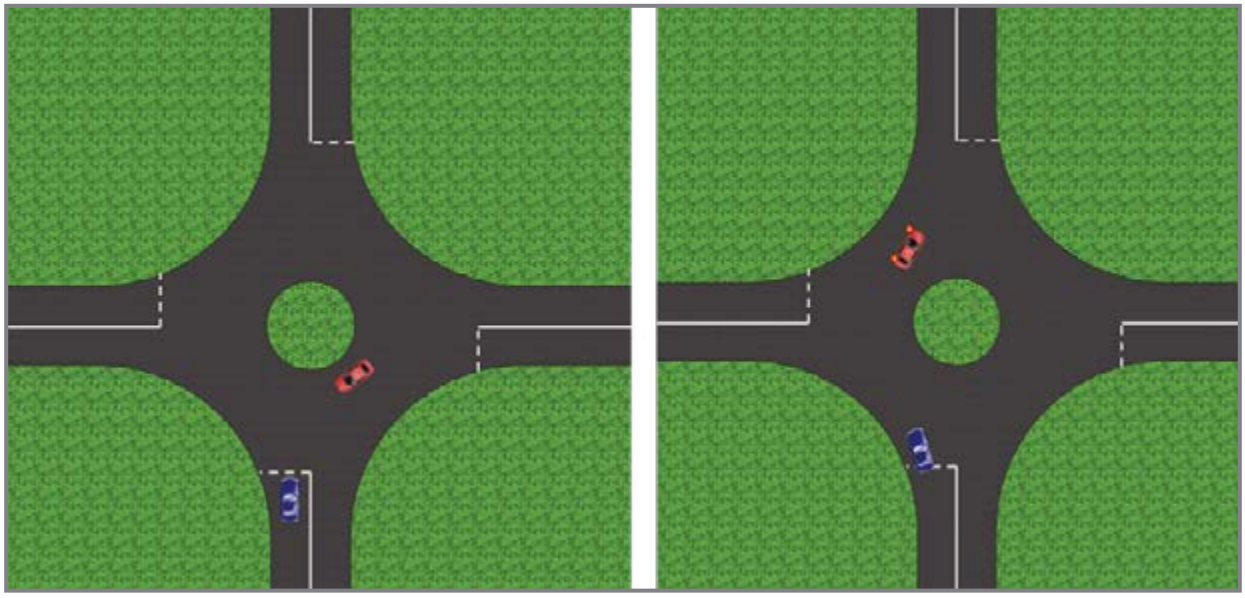


Figure 4.27 Giving priority to the vehicle already in the roundabout

4.9 Railway Crossing

Railway crossings are accident prone zones (Figure 4.28). Therefore, it is important to take extra precautions while driving at railway crossings. The following are the guidelines to be followed at railway crossings.

Figure 4.28 View of a railway crossing

a) While approaching a railway crossing, slow down the vehicle, listen and look both ways to make sure the way is clear before crossing the tracks.

b) When you see an approaching train, then stop at least 5 metres (in the absence of a stop line) from the nearest railway track or gate.

c) If there are signal lights, wait until they stop flashing and show green indication.

d) If the crossing has a gate or barrier, wait until it rises before you cross the tracks.

e) Make sure the train has passed before you start crossing the track.

f) Never drive around, under or through a railway gate or barrier while it is down, being lowered or being raised.

g) Avoid stopping in the middle of railway tracks.

h) Avoid changing gears while crossing the railway tracks.

i) If the vehicle is trapped on a crossing, immediately evacuate the people inside, move to a safer place, and then contact authorities.

j) If you are approaching a railway crossing with a stop sign, you must stop unless otherwise directed by a flagman.

k) Take extra care if there is more than one railway line.

4.10 No Stopping Zones

You are already familiar with sign for 'No Stopping Zones' (Figure 4.29). In general, wherever you find a 'No Stopping sign', you should not stop your vehicle there. Even in the absence of a No Stopping sign, you should not stop your vehicle in the following locations.

a) Intersections: Intersections are important and need to be kept free so that vehicles can move freely. Even if signal shows green, you should not enter the intersection unless you know that you can safely clear the intersection without any blockage. This otherwise will lead to downstream spill over.

b) Crosswalks: You should never stop the vehicle on the crosswalk. This may force the pedestrian to cross the road in an unsafe manner.

c) Tunnels and elevated roadways: Elevated roadways and tunnel have no provision for stopping the vehicles. Hence, you should never stop your vehicle on these segments of the road. (Figure 4.29)

Figure 4.29 An example of no stopping zone

4.11 Hand Signal

It is important for you to show your intentions to other road users using proper signal indications. While some of the actions (left turning, right turning, stopping, etc.) can be indicated using both vehicle lights and hand signals, there are some actions for which you must use hand signals. Such actions include giving indications to the following vehicle to overtake your vehicle, asking the following traffic to slow down their vehicle, etc. Therefore, it is important for you to use the following hand signals when needed (Figure 4.30).

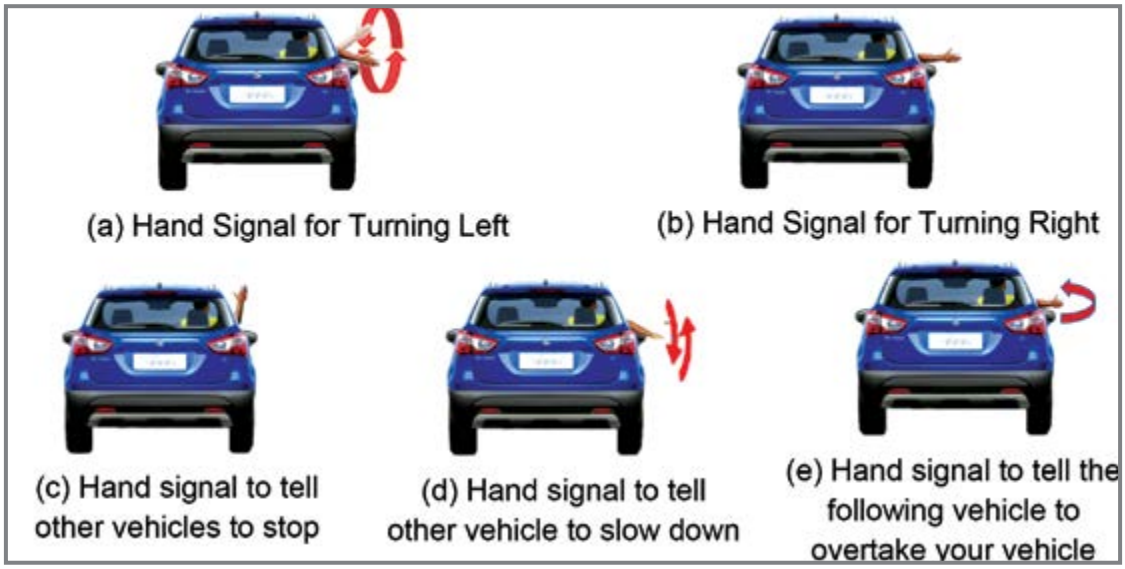


Figure 4.30 Various types of hand signals

4.12 Use of Lights

There are different types of lights in a vehicle, which are intended to be used in different situations. As a driver, it is very important for you to know the function of these lights and to use them in appropriate situations. The following are the guidelines for using various types of lights which include Full Beam Light, Dip Light, Hazard Blinkers, Fog Light, Turning Indicators, and Parking Light.

4.12.1 Full/High Beam Lights

Inappropriate use of full beam lights often causes blinding (temporary blindness due to bright light), annoyance, and distraction to other road users. Therefore, it is essential for the drivers to know how to use full beam light without causing inconvenience to other road users (Figure 4.31). The following are the guidelines for using full beam lights.

Figure 4.31 A typical view of full beam light

a) Use full beam lights when there is insufficient street lighting, and it is difficult to see the roadway.

b) Do not use full beam lights in a built-up area (say, residential area, commercial area) where there is good street lighting.

c) Do not use full beam lights when stopped in traffic.

d) Do not use full beam lights when oncoming traffic or bicyclists or pedestrians are approaching on an undivided road.

e) Do not use full beam lights when your vehicle is stopped or parked.

4.12.2 Low Beam/Dip Lights

The following are the guidelines for using low beam lights (Figure 4.32).

a) Use dip lights when driving in a built-up where there is good street lighting.

b) Use dip lights when following closely behind another vehicle or when you see their rear red lights.

Figure 4.32 A typical view of low beam light

4.12.3 Hazard Blinkers

The following are the guidelines for using hazard blinkers (Figure 4.33).

Figure 4.33 A typical view of hazard blinkers

a) Use hazard blinkers when there is a hazard on the road ahead, so as to inform other drivers regarding the hazard.

b) Use hazard blinkers when your vehicle is stationary and causing a temporary obstruction.

c) Use hazard blinkers when there is a breakdown in a dangerous place that could affect other traffic.

d) Use hazard blinkers during inclement weather condition when visibility is low.

e) Use hazard blinkers when anything goes wrong while you are in motion (say, the brake is not working).

f) Do not use hazard blinkers to stop anywhere you wish.

g) Do not rely on hazard blinkers to keep you safe.

4.12.4 Fog Lights

The following are the guidelines for using fog lights.

a) Use the fog lights if you are driving in fog.

b) Do not use fog lights when visibility is good.

4.12.5 Turning Indicator

Turning indicator should be used only to indicate turning left or right (Figure 4.34). Do not use turning indicator or hazard blinker to indicate the straight movement.

Figure 4.34 A typical view of turning indicators

4.12.6 Parking Lights

The following are the guidelines for using parking lights (Figure 4.35).

Figure 4.35 A typical view of parking lights

a) Make sure that other road users can see your parked vehicle.

b) Do not use hazard blinkers when the vehicle is simply parked by the roadside.

4.13 Use of Horn

Use of horn is often not clearly understood, and drivers tend to use it unnecessarily in many situations. While honking may be necessary at many locations, it is necessary to know where it is restricted. In general, hospitals, schools, place of worship, residential areas, etc. are considered to be 'No Honking Zones'. The following are the guidelines for using the horn.

a) Use horn to alert another driver who might turn in front of your vehicle and cause a collision.

b) Use horn to alert pedestrians and animals to avoid a collision.

c) Use horns on narrow mountain roads, where you cannot see at least 60 m ahead of your vehicle.

d) Use horns at horizontal curves.

e) Do not fit loud, multi-toned or harsh and shrill sounding horns.

f) Do not use the horn to warn other drivers that they made a mistake.

g) Do not use horn out of frustration.

h) Do not honk at pedestrians, bicyclists, or motorcyclists unless it helps you to avoid a collision.

i) Always remember that the horn sounds much louder outside your vehicle.

4.14 Riding on Running Board

Riding on running board is a dangerous practice which is often seen in shared modes of transport, especially in buses (Figure 4.36). The driver and conductor should strictly follow the guidelines which are discussed below.

a) As a driver, you should not permit any person to travel on the running board.

b) You should not permit any person to travel on fenders, bumpers, and the top or outside step of any vehicle.

Figure 4.36 Example of riding on running board

4.15 Vehicle Modification Procedure

The procedure for vehicle modification/alteration is lengthy and expensive. The modifications you make in your vehicle should be in line with the defined norms under Central Motor Vehicle Rules (CMVR) 1989. If you wish to modify your vehicle, you have to follow the procedure given below.

a) Get the Modification plans approved by the vehicle manufacturer.

b) Modify the vehicle according to the approved plan.

c) Get the modified vehicle approved by the vehicle manufacturer.

d) If approved, the owner has to get the vehicle certified at one of three government-approved certifying agencies.

- Automotive Research Association India (ARAI), Pune
- Vehicle Research and Development Establishment, Ahmednagar
- Indian Institute of Planning and Management, Dehradun

e) Once cleared by them, you should get a certificate from Regional Transport Office (RTO) which will enable you to drive the modified vehicle.

It may be noted that the vehicle modification is a complex and lengthy process. So, you should avoid it as far as possible. If you still plan to modify your vehicle, then you should contact the nearest RTO to know the detailed procedure.

4.16 One-way Traffic

The traffic that moves in a single direction is called as one-way traffic. A one-way street is designed to direct the vehicle to move in one direction. The following movements are restricted in a one-way road (Figure 4.37).

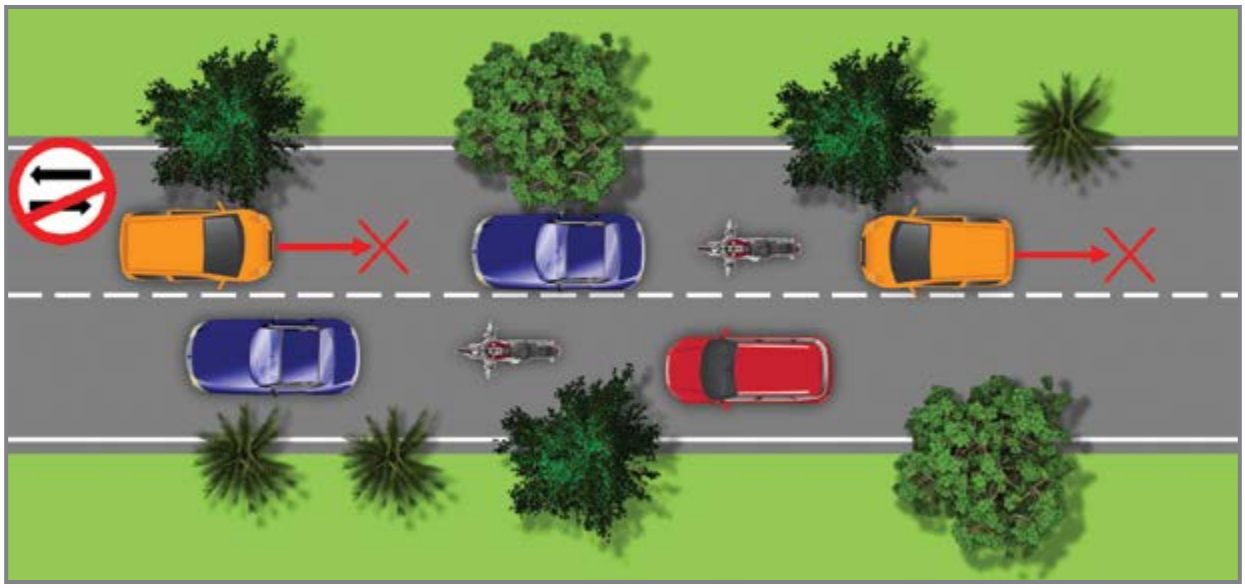


Figure 4.37 Examples of wrong practice at one-way road

a) Do not drive in the direction in which movement is restricted.

b) On a one-way road, it is not allowed to reverse your vehicle in the restricted direction.

4.17 Resoled Tire

Use of resoled tires is common nowadays. Unless the sidewalls of the tyre are strong and evenly stiff, it is not advisable to re-tread it. It is also important to note that re-treading of tyres will lead to joints which cause unevenness on tires. Tires may also become stiff or overly soft, that will affect the stability of the vehicle leading to accidents. In short, from the safety point of view, it is not advisable to use resoled tyres in your vehicles unless the quality of resoling is assured.

4.18 Vehicle Specific Safe Driving

General rules/guidelines for safe driving have been discussed in the previous sections. Apart from the general guidelines, there are guidelines which are specific to different vehicle categories. As a driver, it is important for you to understand and follow such guidelines from the safety point of view. This section deals with guidelines pertinent to:

- Motorized Two Wheelers
- Taxies and Auto Rickshaws
- Buses
- School Vehicles
- Goods Carriers

4.18.1 Motorized Two Wheeler

Motorized two-wheeler riders are one of the most vulnerable road users. Being a vulnerable road user, it is important for you to wear safety accessories which include Helmet, Gloves, Riding Boots, etc. (as shown in Figure 4.38).

Figure 4.38 A bike rider with safety accessories

a) Helmet: This is the most important safety accessory as it protects your head from any injury.

b) Gloves with knuckle protection: In the case of any accident, your hands reach for nearby support or to the ground and therefore, become more susceptible to injury.

c) Riding Boots with steel toes: Boots are one of the most important safety accessories as your feet are highly at risk to injury while riding a two wheeler.

Guidelines for riders

The guidelines specific to the riders are discussed below.

a) In case of two-wheelers, the blind spot is very important as the two-wheelers may easily fall in the blind spot of vehicles (Figure 4.39). Therefore, as a rider, you should be aware of this fact, and accordingly, avoid falling into the blind spots of other vehicles.

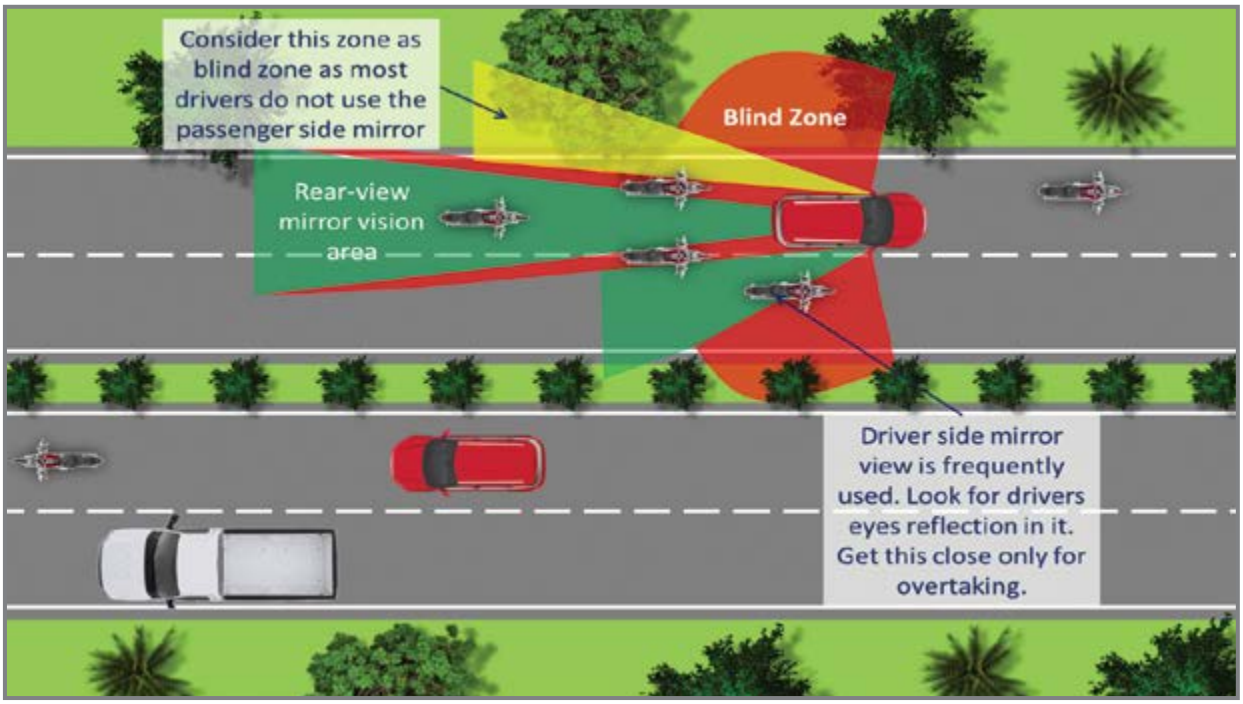


Figure 4.39 Blind spots: potential hazard locations for bike riders

b) A staggered formation (if space allows) is desirable as it provides better visibility and safe braking distance (Figure 4.40).

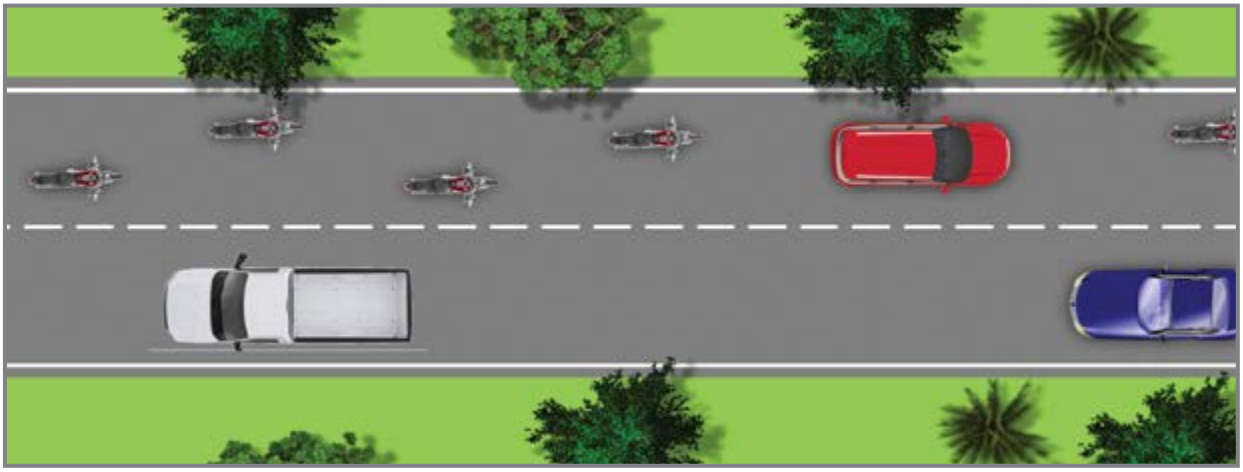


Figure 4.40 Staggered formation of two wheelers

c) You should not carry more than one passenger at a time as the vehicle is designed to take only two persons (rider and pillion rider).

d) Keep both your feet on the foot pegs.

e) Keep both your hands on the handlebars while driving (except while giving hand signals).

f) In order to make yourself visible to other road users, wear light coloured clothes at night.

Guidelines for pillion riders

It is the duty of bike rider to ensure safety of the pillion rider. As a bike rider, you need to make sure that the pillion rider follow the guidelines given below.

a) Wear helmet, boots and other safety accessories as specified for the rider.

b) Keep both feet on the foot pegs when the motorcycle is moving. This will help the rider to maintain balance and ride safely.

c) Hold on to the rider as it helps to maintain balance and navigate safely.

4.18.2 Taxi and Auto-Rickshaw

Taxi and auto-rickshaw drivers should be more responsible as they carry passengers and drive for long hours. Apart from the general guidelines, there are specific guidelines you need to follow as a Taxi/Auto-Rickshaw driver. These guidelines are discussed below.

a) Be co-operative to the passengers and give sufficient time for them to board and alight the vehicle.

b) You should not carry passengers beyond the vehicle capacity as prescribed by the manufacturer.

c) Do not allow passengers to sit in a manner that any part of their body or belongings extends beyond the vehicle.

d) Do not allow anyone to stand or sit in a manner which hampers your control over the vehicle.

4.18.3 Bus

The responsibility of bus driver is much higher as it involves the safety of a larger group of passengers. As a bus driver, it is important for you to follow the bus specific guidelines as discussed below.

a) You should stop the bus as close to the kerb as possible at bus stops. This is to ensure safety of boarding/alighting passengers.

b) While reversing the vehicle, you must be assisted by a trained person (bus conductor/helper).

c) You should ensure that the emergency doors are working properly.

d) Do not allow anyone to sit on bus rooftop as this is highly unsafe.

e) Before starting the bus, you should ensure that the doors are closed.

4.18.4 School Vehicle

School vehicles are one of the most sensitive vehicles as these carry children in a group. The following are the specific guidelines you need to adhere as a driver of a school vehicle (school bus and shared cabs).

a) You should check that the children are safely seated before starting the vehicle.

b) You should follow the routes and stops as specified by the school.

c) You should drop the children at designated parking area.

d) Give a signal indication (hand signal) to the children when it is completely safe to cross the street. It is also important to wait until the children cross the street safely.

e) Turn on the parking lights while picking up or dropping off children, and use appropriate hand signal before stopping and starting.

f) Do not rush through the traffic in order to reach the destination as fast as possible. Always give priority to safety over schedule adherence.

g) When children are on-board, never leave the vehicle without taking the key out of the ignition slot.

4.18.5 Goods Vehicle

In general, driving a goods vehicle is a challenging task as the vehicle is heavy and controlling a heavy vehicle is not as easy as light vehicles. As a driver of a heavy vehicle, it is important for you to follow the guidelines given below.

a) Make sure the following tools and equipment are available in the vehicle (Figure 4.41).

Figure 4.41 Tools and equipments required for heavy vehicles

b) Be alert, healthy and prepared for the driving task.

c) You must adhere to the maximum permissible weight as specified by the authority. Remember that police is empowered to get your vehicle weighed and instruct you to offload the excess load, if any. You may also be punished for overloading your vehicle.

d) You should use appropriate flags, barriers, flares, lights and warning signals if it is necessary to park in a thoroughfare.

Guidelines for other Drivers with respect to Heavy Vehicles

While sharing the road with a heavy vehicle, other vehicle drivers must be careful and follow the guidelines given below.

a) As you drive close to a heavy vehicle, beware of strong wind which may displace your vehicle from the driving path. As a result, you may lose control over your vehicle. Therefore, it is important for you to be watchful of this condition while overtaking or being overtaken by a heavy vehicle.

b) Stay out of the blind spots of a heavy vehicle. The blind spots for heavy vehicles are shown in Figure 4.42.

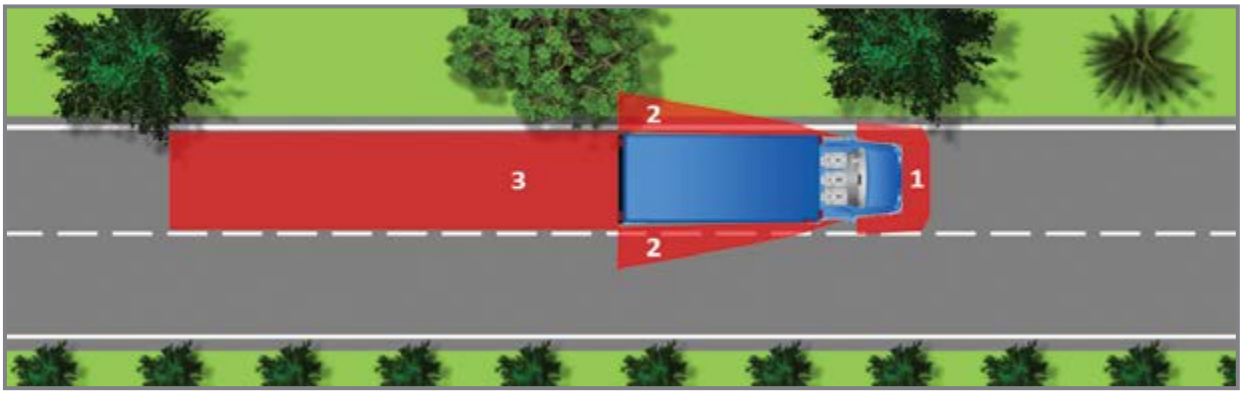


Figure 4.42 Blind spots of heavy vehicle

4.19 Common Unsafe Practices

This section deals with some of the most common unsafe acts which are practised mainly due to lack of knowledge and misguidance. Such unsafe practices and corresponding safe practices are presented in Table 4.1.

Table 4.1 Common unsafe practices

Unsafe Practices	Safe Practices
a) It is not necessary to follow traffic signals after 10 PM	√ Always obey a functional traffic signal irrespective of the time.
b) Right turning indicator can be used as a signal to overtake your vehicle.	√ Use the turning indicators only for turning right or left.
c) The seat belt is important only for the drivers and it is not necessary for short trips.	√ The seat belt is always required for all the passengers. All the passengers are travelling at same speed and hence, at the same risk. Therefore, every passenger should wear the seat belt regardless of the trip duration.
d) Vehicles may be loaded with oversized object extending beyond the length or width of the vehicle.	√ Never load any motor vehicle in a manner likely to cause danger to any person in such manner that any part extends laterally beyond the side of the body or to front or to rear or in height beyond the permissible limit.

4.20 Exercise Questions

1) **How to check for vehicles/pedestrians in left/right side of your vehicle in a blind spot?**
   a) Look through rear view mirror
   b) Look through side view mirror
   c) Look back while driving
   d) Look along your shoulders

2) **Parking is restricted _____ away from the railway crossing.**
   a) 5m
   b) 10m
   c) 15m
   d) 20m

3) **How to park your vehicle when no specific instruction is given at the parking area?**
   a) 45 Degree angle parking
   b) 30 Degree angle parking
   c) Parallel parking
   d) Double parking

4) **While doing parallel parking, minimum distance you need to maintain between the vehicles is_____**
   a) 0.5m
   b) 1m
   c) 1.5m
   d) 2m

5) **What does a continous flashing red light indicate?**
   a) Stop your vehicle and wait until flashing red light goes off
   b) Clear the intersection
   c) Come to a full stop and may proceed only when crossing is safe and clear
   d) Slow down and may proceed only when crossing is safe and clear

6) What does a red light indicate?

a) Stop your vehicle
b) Clear the intersection
c) Come to a full stop and may proceed only when crossing is safe and clear
d) Slow down and may proceed only when crossing is safe and clear

7) Use full beam lights when_____

a) Oncoming vehicle is approaching
b) There is not enough street lighting
c) Parking the vehicle
d) Emergency stopping

8) Do not use hazard blinkers while_____

a) Parking the vehicle
b) Breakdown in a dangerous place
c) Hazard on road
d) Vehicle is causing temporary obstruction

9) Use turning indicators while_____

a) Parking the vehicle
b) Indicate hazard on road
c) Turning the vehicle
d) Straight movement at intersections

10) Parking is restricted _____ away from the intersection.

a) 5m
b) 10m
c) 20m
d) 30m

11) Use horn _____

a) While driving in School Zones
b) While driving in Residential areas
c) When driving near hospital
d) at horizontal curves

12) Which of the following is a safe practice?

a) Riding on running board
b) Riding on Fenders
c) Overtaking a vehicle from left side
d) Overtaking a vehicle from right side

13) Which of the following is a safe practice?

a) Only driver should wear seat belt
b) Only people sitting in front seat should wear seat belt
c) Wear seat belt only during long trip
d) All passengers need to wear seat belt regardless of trip duration

14) Parking is restricted within _____ of a fire hydrant.

a) 1.5m
b) 5m
c) 10m
d) 20m

15) Parking is restricted within _____ of a driveway.

a) 1.5m
b) 5m
c) 10m
d) 20m

CHAPTER 5

Driving in Complex and Sensitive Environment

Jahar Ranjan Sarkar
&
Annam Sai Kiran

5.1 Background

General safety guidelines in favourable conditions are discussed in the previous chapter. In addition, it is also important for you to understand how to drive safely in various complex and sensitive environments, such as construction zones, inclement weather conditions (rain and fog), difficult terrains (hills & mountains), and eco-sensitive zones. Driving in the complex and sensitive environment is challenging, and you should be always expecting the unexpected. In such situations you need to be very careful, and necessary precautions need to be taken. The present Chapter discusses various safety guidelines you need to follow while driving in complex and sensitive environment.

5.2 Driving in Construction Zone

Road works are carried out for constructing new roads and repairing/extending existing roads. The area under the influence of such road works is called Construction Zone. According to Ministry of Road Transport and Highways (MoRTH), in the year 2015, there have been more than 10,000 accidents in road construction zones all over India. This scenario indicates how essential it is for you to follow the safety guidelines while driving through a construction zone.

5.2.1 Overview of Construction Zones

In the first place, it is important for you to understand construction zone and its various sub-zones (Figure 5.1). These zones are briefly discussed in the following subsections.

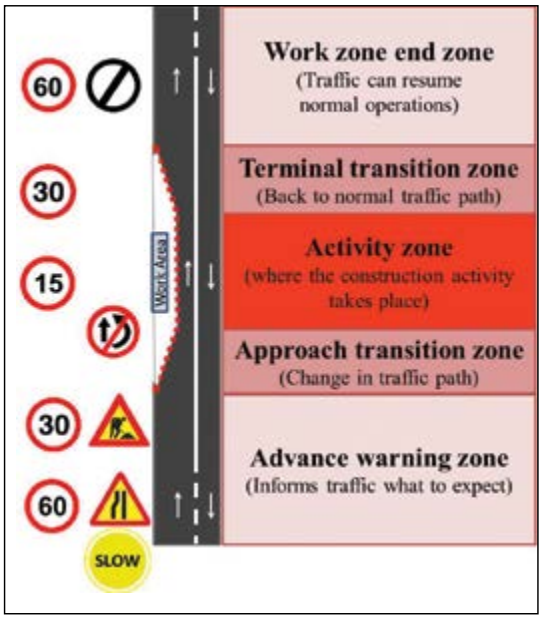


Figure 5.1 Overview of construction zone

5.2.1.1 Advance Warning Zone

In this zone, you are warned about upcoming hazard using blinkers and road signs (Slow Down, Narrow Road Ahead, Men at work, etc.). These signs would pre-warn you for change in driving speed, directions, etc. Also, the mandatory posted speed limit sign will notify the safe speed for that location. In the absence of any speed limit sign, you should drive at a speed less than 30 kmph.

5.2.1.2 Approach Transition Zone

This is the area just before the actual activity location. Delineators and diversion signs (Figure 5.2) are provided to assist you to deviate from the normal path.

Figure 5.2 Different construction sites with delineators and diversion sign

5.2.1.3 Activity Zone

The actual construction/repair work takes place in this zone. While passing through this zone, you need to be extra cautious and limit your speed within 20 kmph in the absence of any posted speed limit.

5.2.1.4 Terminal Transition Zone

In this zone, traffic is gradually redirected back to the normal path. You can gradually increase the speed up to the posted speed limit or 30 kmph.

5.2.1.5 Work Zone End Zone

This zone starts at the end of the terminal transition zone and ends at the point where sign board indicates 'End of Work Zone' or indicates the initial speed limit posted for the road before entering Work Zone.

5.2.2 Safety Guidelines for Driving in Construction Zones

As a driver, it is important for you to follow the guidelines given below while driving in construction zones.

5.2.2.1 Be Alert

a) Always be prepared for changing lanes, change in speed limits, sudden stoppages, sharp diversions, etc.

b) Always be alert of unexpected slowing down, stop, or change of lanes.

c) Always be extra cautious and drive defensively during rain as pavement conditions may differ.

d) Always drive carefully expecting that workers or construction vehicles may make sudden disruptive movements.

e) Always try to avoid driving over any loose construction material.

f) Always stay prepared to give way to the traffic from opposite direction, in a narrowed down stretch, unless you are the first to blink your headlight.

g) It is expected to have proper signage, delineators, road signs, crash barriers, lighting, etc. in a construction zone and you need to follow them strictly. Even otherwise (Figure 5.3), you should follow the safety guidelines.

Figure 5.3 Construction site with no signs, delineations or warnings

5.2.2.2 Slow Down

Reducing the vehicle speed gives you more time to react rationally to the situation. For example, imagine you are driving at 60kmph, and you find a sign indicating a construction zone at a distance 300m ahead. After seeing the sign, if you still drive at the same speed, it will take only 18 sec to reach the site which is really a short time for you to adjust to the change in road environment. On the other hand, if you gradually slow down to 30kmph, it will take more than 30 sec which will give you enough time to take necessary safety manouevre.

a) Whenever you see blinkers and/or road signs (warning about construction zone) slow down the vehicle gradually (Figure 5.4).

b) Look out for Posted Speed Limits, and try to maintain a consistent speed with the traffic flow. As mentioned before, in the absence of posted speed signs, it is necessary to drive at a speed less than 30kmph till activity zone and reduce the speed further to 20kmph upon entering the activity zone.

c) Reduce your speed further, based on the road surface and weather conditions, as the posted speed limits do not account for unforeseen inclement weather (Figure 5.5).

d) At the approach to bridges, speed needs to be reduced in all cases during construction period irrespective of whether construction work is going on at these locations.

Figure 5.4 Construction site with proper warnings

Figure 5.5 Construction site during rain

5.2.2.3 Merge into the Proper Lane

In general, at construction zones, one or more lanes remain closed for construction by leaving atleast one lane open for traffic flow.

a) If the lane in which you are driving is open, then maintain your lane.

b) If informed about lane closure or diversion ahead, then merge into the lane which is open well before the point of the lane closure.

c) Check for a safe gap, indicate the turning (use turning indicators) at least 5 sec before starting to change the lane, and complete the lane change by taking another 10 sec at least (Figure 5.6).

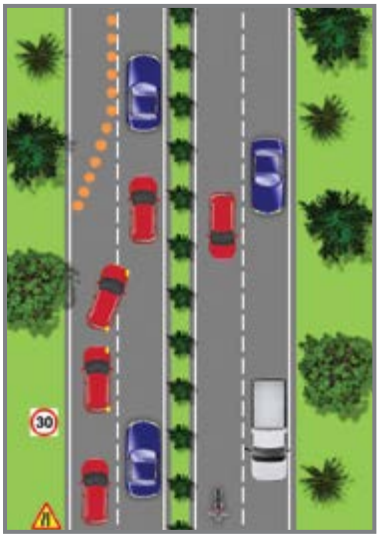


Figure 5.6 Changing lanes at construction zone

d) Do not overtake in construction zones. Overtaking at construction zone is unsafe mainly due to limited space and/or inadequate sight distance.

5.2.2.4 Stay Alert

Construction zones are congested mainly due to limited space and obstructions. As a result, vehicles move slowly and close to each other. In such situations, it is important for you to be alert and follow the guidelines given below.

Figure 5.7 Avoid distractions

a) You should dedicate your full attention to the roadway and look for traffic signs for useful information.

b) While driving, you should be cautious about the vehicles around and pay attention to the brake lights of leading vehicle.

c) Avoid using a cell phone or any other means of distraction (Figure 5.7).

d) As visibility is low during night time, you should be extra cautious while driving.

5.2.2.5 Avoid Tailgating

Rear-end collision (Figure 5.8) is the most common type of accident in a highway construction zone. These collisions happen due to vehicles travelling too closely or too fast for the conditions.

Figure 5.8 Typical rear end collision at a construction zone

a) In order to prevent such accidents, you should leave 5 seconds (approx. 30m) of gap between your vehicle and the leading vehicle.

b) If the vehicle behind you is following too closely, you may warn him (i) by turning the lights on and off several times to illuminate your tail lights during the day time, and (ii) by tapping the brake pedal lightly to illuminate the brake lights during night time, if the vehicle and situation permit to do so.

c) Do not slam the brakes or reduce the speed drastically unless there is an emergency.

d) Understand the tailgating warning from the vehicle in front and increase the gap between your vehicle and vehicle in front.

5.2.2.6 Be Patient

Construction zones create a bottleneck on roads resulting in a reduction in traffic speed and thereby causing delay. Hence, as a driver, it is important for you to be patient, respect the posted speed limit, and drive safely.

If you are already aware of construction zones on a particular route, either adjust your schedule accordingly to reach the destination on time or choose an alternative route.

5.3 Inclement Weather (Rain, Fog)

Climatic conditions change throughout the year. Dry climatic conditions are the most favourable for driving due to good visibility and dry road surface. However, in other climatic conditions, such as rain and fog, the road condition and visibility are hindered, and hence, driving in such conditions becomes challenging. During any inclement weather or unfavourable driving conditions, your first reaction should always be to adjust your speed accordingly. While driving in inclement weather your intention should be 'to see and to be seen' (i.e. improve the visibility). In this section, the safety rules and guidelines for driving in such conditions are specified.

5.3.1 Rain

In monsoon season, rain is a common occurrence. It is important for you, as a driver, to be aware of the additional precautionary measures to avoid an accident and make driving hassle free.

5.3.1.1 Things to Check before Rainy Season

Every year before the start of rainy season, you should do the following checks to ensure that your vehicle is fit for travel in such conditions.

a) Wipers: Wipers are used during rain for improving the visibility. It is important for you to check the condition of wipers before the start of rainy season. While using the wipers after a long time, check whether it has become hard and lost the flexibility to maintain a uniform contact with the windshield. Clean the wipers and the glass off any dust and run the wipers

while pouring water from the top, to detect any of the common problems as given in Figure 5.9. If any of these happens, you should change the wiper blades.

b) **Windscreen cleaning liquid:** Make sure that there is an adequate amount of windshield solution in the designated tank. Using Hydrophobic fluid will increase the visibility as water trickle off the windshield glass instead of sticking to it. If there are any undesireable marks / dirt on the glass reducing the visibility, this practice helps to clean the windscreen glass while driving. When rain is expected, you should clean all windows before the start of your journey. Local use of clean plain water with a sachet of shampoo also works pretty well, when the fluid mentioned above is not handy.

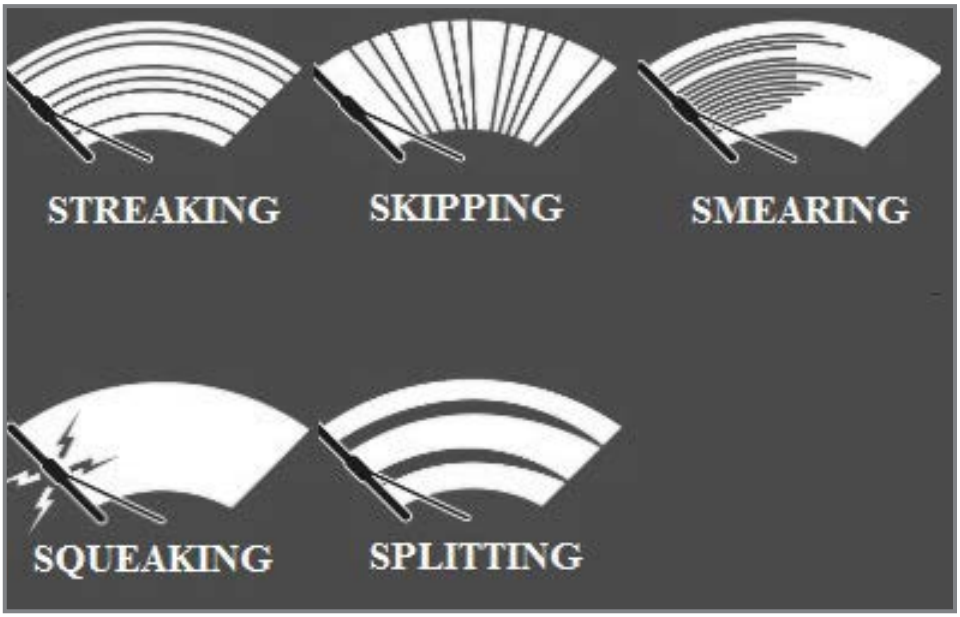


Figure 5.9 Common wiper blade problems

c) **Cleaning cloth:** Keep a cleaning cloth handy ideally at the front door pocket where you can reach for it without taking your eyes off the road when the windscreen/windows inside requires cleaning due to mist formed on it.

d) **Tire treads:** The grooves in the tires are called tire treads. During rain, you may expect water flow on roads. The treads in tire help to disperse the water from underneath the tires and maintain contact with the road surface preventing your vehicle from hydroplaning (skidding). It may also be mentioned that the braking distance depends on the depth of the tire tread. If the depth of tire tread is less than 3mm, then you should replace your tires (Figure 5.10).

Figure 5.10 An example of a new tire and worn off tire

e) **Lights:** Before travelling, you must check to ensure that all lights (headlights, tail lights/brake lights, indicator lights, hazard blinkers) are functioning. Replace the dead bulbs if any. It important that you should be able to see other vehicles and other vehicles should be able to see you.

5.3.1.2 Guidelines to Drive in Rain

Rain reduces not only your visibility but also the amount of grip your vehicle has on the road, which further increases the stopping distance. The following guidelines will help you to drive safely in rainy conditions.

a) Depending on the intensity of the rain, adjust the speed of wipers.

b) Under any unfavourable driving conditions, you should slow down your vehicle.

c) In wet road conditions, friction between the tires and road surface is reduced. Therefore, as a rule of thumb, in rainy weather reduce your speed by 1/3rd of posted speed to account for change in friction of road surface. If the speed limit is 60kmph, try not to exceed 40kmph when the roads are wet.

d) The safe distance between the vehicles is 2 seconds in favourable conditions. However, while driving in the rain, you should maintain a distance of 9 seconds or more from the vehicle ahead.

e) During heavy rains, turn on the headlights even in the day time as it helps to improve visibility.

f) You should give turning signal well in advance and brake early as you approach a stop.

g) In rainy conditions, it becomes crucial to stay more alert while driving. You should avoid any activity which distracts you while driving.

h) Unless there is an emergency, you must keep both the hands on the steering wheel, because it gives you more control of the vehicle while turning, recovering from skidding, etc.

i) Avoid driving through deep water or moving water. When the road surface is not visible, it becomes difficult for you to notice any potholes. Your vehicle may get stuck in the potholes. Driving at high speeds in water puddle may damage your vehicle, stall out, and cause inconvenience to other road users. If the water is flowing across at high speeds, your vehicle could also be swept away. Try to avoid such roads by changing the route or wait until the conditions are fit for driving.

j) Reduce your speed further in case there is water accumulation upto your footboard, as the splash which you see outside is also there inside and may hit the hot engine, causing a seizure. Try to maintain a uniform speed and low gear (preferably, 2nd gear) when passing through a water puddle. Always check your brakes after you paddle through a water-logged area. If you feel that braking is insufficient, press the brake often to create heat by friction and dry the brakes.

k) You should use both the Hazard Lights and Fog Lights when visibility is low due to torrential rains. It is better to park your vehicle on the side for some time till the intensity subsides.

l) Fogging on windscreen happens when the outside temperature is cooler than inside. In such a case, you should run the AC and direct the air towards the screen by the AC knob. In case there is no AC, open the windows slightly, to equalise the outside and inside temperature and humidity. If it is still foggy, clean the inside windscreen with a cloth.

m) You should clean any mud splash on your vehicle either with a windscreen water spray or by stopping your vehicle near a water source and splashing water.

5.3.1.3 Skidding/Hydroplaning

Hydroplaning happens when the water accumulated under the tires is more than the amount of water dispersed by the tires (Figure 5.12). The water pressure can cause your vehicle to rise and slide on top of a thin water layer that remains

between your tires and the road surface. This can result in a complete loss of contact of your vehicle with the road surface, putting you in danger of skidding. The chances of hydroplaning depend on various factors like speed of the vehicle, depth of tire tread, depth of water on the road, and vehicle weight.

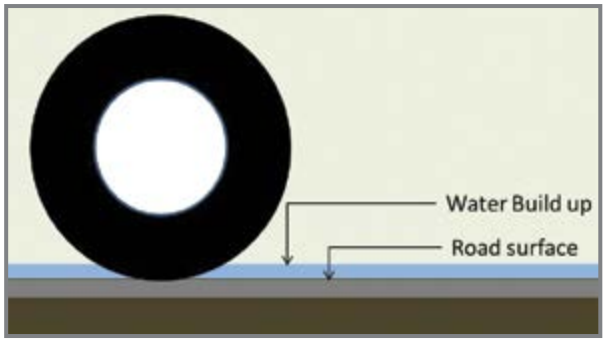


Figure 5.11 Good contact between tire and road surface

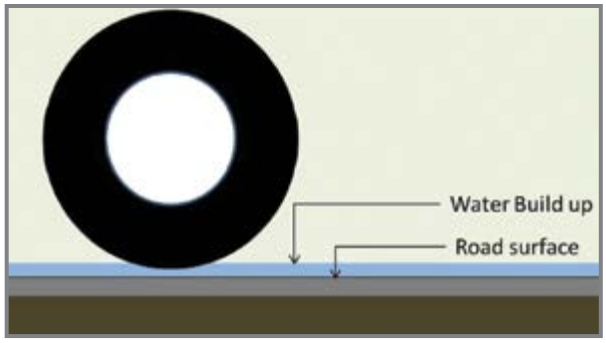


Figure 5.12 Hydroplaning (no contact between tire and road surface)

a) The speed of the vehicle: You should travel at low speed as it gives more time for the tires to dissipate the water and maintain contact with the road surface. At higher speed, the chances of hydroplaning are more.

b) The depth of tire treads: Deeper tire treads dissipate more water compared to worn out and smooth tires and reduce the chances of hydroplaning. When the depth of tire treads is less than 3 mm, you should replace the tires.

c) The depth of water: Higher the water level, higher the chances of hydroplaning. However, hydroplaning may even occur when the water level on the road is low, so you have to be cautious while driving under such conditions.

d) The weight of vehicle: Heavier the vehicle, lower are the chances for hydroplaning. If your vehicle is light, you have to be more cautious.

For you as a driver, it is important to learn how to avoid hydroplaning and regain control when it happens. Although it can be a scary experience, the most important thing is to stay calm.

5.3.1.3.1 Avoiding Hydroplaning

a) Use of good quality tires: As informed earlier the depth of tire tread plays a very crucial role in preventing hydroplaning. The depth of tire tread should be more than 3 mm.

Figure 5.13 Thin oil film formed over road surface

b) During the initial period of rain, even when the water level is low, the water mixes with any oil and grease or bird droppings which are accumulated on the road surface and forms a thin layer which increases the chances of hydroplaning (Figure 5.13). Therefore, you should be more careful during initial 10-15 minutes of rain.

c) Slow down your vehicle gradually as it gives you more control. Do not slam the breaks as it may cause the vehicle to skid.

d) You should avoid driving through water puddles and standing water. Try to follow in line with the vehicle ahead as some of the water is already dissipated along the tire paths by the front vehicle.

5.3.1.3.2 Regaining Control from Hydroplaning

a) Recognising Hydroplaning: It is important for you to understand that the vehicle is experiencing hydroplaning. While driving on a wet surface,if you feel that the vehicle is going out of control, it indicates hydroplaning. Depending on the wheels which are hydroplaning, the vehicle starts to skid in different directions.

b) Do not panic: It is very common that when the vehicle starts to skid, the driver panics and acts in a hurry which makes the situation even worse. You have to be aware that the hydroplaning can be overcome by following simple procedure which can only be performed when you are calm and composed. Sometimes the hydroplaning happens only for a few seconds, and the vehicle regains its traction. Do not slam the brakes in panic as you will further lose control of the vehicle.

c) Release foot pedals: Once your vehicle starts to hydroplane, remove your feet from the acceleration, brake and clutch pedals.

d) **Steer towards target:** Select a target ahead in the direction you want the vehicle to go (a tree, pole, etc.) and steer accordingly. You should not turn sharply which may lead to unwanted movement. Hold the steering wheel firmly and gently turn steering in the direction of the target.

e) **Brake after control:** Wait for your vehicle to gain control and then apply your brakes gently. Park your vehicle on the side of the road.Take a few minutes of time to resume driving.

5.3.2 Fog

When you are not familiar with driving in fog, it becomes quite challenging. The visibility is severely hampered and, in some cases, the visibility is limited to a few meters only. As a driver, it is important for you to learn how to drive safely in fog conditions as it is a common occurence in winter season. During fog, you are advised to use fog lights. Fog lights are specially designed to improve the visibility during fog. The fog lights are generally installed on or below the front bumper. These lights are aimed towards the driving direction as far as possible. The difference between low beam, high beam and fog lights is the way they project the light (Figure 5.14).

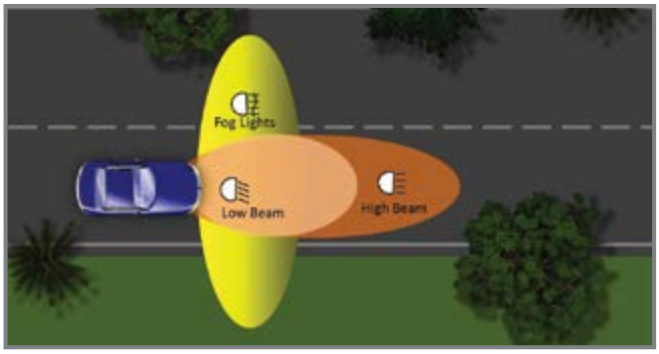


Figure 5.14 Fog lights, low beam and high beam

5.3.2.1 Guidelines to Drive in Fog

During winter season, be aware of the local weather conditions. In general, fog is often a morning or evening weather phenomenon. Therefore, if possible avoid driving during these periods. However, if driving is unavoidable then be extra cautious and follow the guidelines given below.

a) Especially in fog, the natural tendency of most drivers is to turn on the light at high beam which is dangerous for you as well as vehicles coming in the opposite direction. Due to the fog, high beams will be reflected back and impair your visibility even more.

b) If your vehicle is not equipped with fog lights, then you should turn on headlights at low beam. These lights can also be used in addition to fog lights. It will be your choice whether to use these lights or not based on the visibility condition of that location.

c) Drive defensively depending on the density of fog and visibility distance. It is essential to use the hazard lights in foggy weather, when the visibility is impaired. Hazard lights will improve visibility towards your vehicle. Occasionally, you should press brake paddle to light up brake lights and caution the following vehicle. Try to follow the tail light of the vehicle in front of you. You should always keep a safe stopping distance of 9 seconds or more.

d) For foggy windscreen follow the same step as mentioned in section 5.3.1.2. However, during winter, you can blow hot air on the windscreen.

e) When you are not comfortable to drive due to inadequate visibility, pull over the vehicle at a safe place. Turn the hazard light and parking light on (Figure 5.15). Never stop the vehicle on the road.

Figure 5.15 Hazard lights/ blinkers switch on dash board

f) Ask your fellow passengers to keep an eye on oncoming vehicles and obstacles on the road.

g) In foggy conditions, open the windows to hear other vehicles more clearly and turn on the tail lights to make your vehicle more visible to others.

5.4 Difficult Terrain (hilly/mountainous roads)

Driving a vehicle in a hilly road can be challenging, particularly if the gradient is very steep. Like other complex driving conditions, you have to follow some specific precautions and rules to drive safely in such terrains. Some guidelines are provided in the following sub-sections.

5.4.1 Guidelines to drive in difficult Terrain

a) **Starting a vehicle:** Irrespective of whether you are going downhill or uphill, starting a vehicle in difficult terrain is not the same as starting at grade or level terrain. While going downhill, the vehicle starts rolling down as soon as you release the hand brakes. When you are going upgrade, i.e. the vehicle starts rolling back. While it is easier to control the vehicle while going down, it is far more difficult to manoeuvre the vehicle when you are rolling back. While going uphill, starting a vehicle from stop position is a bit tricky, and lots of drivers fail in this situation. The vehicle should not roll back at all while starting. You need to follow the steps given below to start a vehicle facing uphill smoothly.

- You should pull the handbrake, press and hold the release button, so that the handbrake is still engaged.
- Then release the clutch gently, while pushing the accelerator enough, till the vehicle starts to move forward steadily (Ensuring that the vehicle does not roll back anymore).
- While giving the required acceleration by progressively releasing the clutch, gently start releasing the handbrake. If for some reason, the vehicle starts to roll back, immediately press the brake and pull the handbrake. Repeat the earlier procedure again.
- To get to 2nd gear or higher gears on upgrade, you will need more acceleration compared to acceleration required on flat grounds.
- While going down in a steep grade, it is always advisable to drive in low gear and use brakes whenever required.
- Remember, your handbrake must always be in smooth working condition.

You should initially practise on relatively flatter slopes before making your way towards steeper slopes.

b) **Right of Way for uphill vehicles:** While driving on hilly areas you should always give way to vehicles travelling uphill.

c) **Taking turns:** Given below are a few turning manoeuvres which you will encounter while driving on hilly roads. Additionally, guidelines to be followed while driving on such locations are discussed below.

- Easy turns: These turns are easy to manoeuvre, with proper sight distance. You need to maintain your lane and drive slowly (Figure 5.16).
- Blind turns: You should honk at every blind turn (unless prohibited) to

alarm the oncoming driver. Always stay in your lane since you cannot see what is coming around the corner. Always drive expecting an oncoming vehicle (Figure 5.17).

- Acute turns: You should drive with low gear and medium speed while negotiating a sharp bend. While driving on an upgrade, you need to accelerate immediately after the bend. Also, you may switch off AC to get more power (Figure 5.18).
- Acute, blind, and steep turn: To manoeuvre such a turn, stay in your lane all along. Though it is extremely difficult to turn left while going uphill, you should shift to low gears, if required, to keep you vehicle in the same lane. However, for heavy vehicles, it is not easy to stay in the same lane. As a driver of heavy vehicle, you should honk ahead of turning so that the oncoming vehicles are warned and can stop at a suitable distance to allow your vehicle to turn safely. In slip zones where honking is prohibited, you should look out for convex mirror at the turning and carefully manoeuvre the turn at a lower speed. During the night time, use headlights to warn the oncoming vehicles (Figure 5.19).

Figure 5.16 An example for easy turn on hill

Figure 5.17 Typical blind turn on hill roads

Figure 5.18 An example for acute turn but not a blind turn

Figure 5.19 An example for acute, blind and steep turn

d) In mountainous terrain, visibility is limited at night. It can be extremely difficult to see oncoming traffic. Therefore, it is advised to avoid driving in such location at night if you are not accustomed to such situations.

e) You should check the functioning of your brake and handbrake every 50km.

Figure 5.20 Road sign to caution for rock fall area

f) Always drive in a low gear while driving uphill/downhill. Keep your foglights and headlights on. Dip the headlight when you see an oncoming vehicle.

g) Drive cautiously when small streams are flowing across the road.

h) At times, rock-fall areas (slip zones) are pre-warned, and you should be extra cautious during heavy rain (Figure 5.20). Honking in such zone is not advisable.

i) In forest area, whether forewarned or not, watch out for wild animals especially during the night.

j) In case your vehicle gets overheated due to driving for a long period in low gear, look for a suitable recess/ wider point, to park your vehicle. Switch off the engine, open the bonnet, turn on the blinkers and parking lights and wait for cooling.

k) Some drivers may not follow the rules, and hence, sacrifice and succumb your right of way to avoid accidents.

l) Before the start of your journey check the weather and terrain conditions in places along your route.

m) Check fuel indicator before you start to climb uphill as you may not find any filling stations until you reach the top of the hill.

n) In case your vehicle needs to be tagged in high altitude keep a torch, ropes, jump cables, etc. Keep a tested fire extinguisher handy. Always have first aid kit in the glove compartment, and an additional hazard triangle.

5.4.2 Things NOT to Do on a Hilly Terrain

a) Many accidents happen on mountains because people try to cut corners from the outer lane. Hence, you should not go out of your lane and also slow down when an oncoming vehicle travelling uphill comes on to your lane.

Figure 5.21 Hazard triangle placed at the breakdown location

b) When driving downhill, you should not drive too fast. Drive slowly and apply brakes whenever required.

c) You should not use brakes unnecessarily. Over-heating of the brakes can cause failure, which is unsafe when you are on hilly terrain.

d) Standing/ Stopping on the mountains is strictly not advisable except at wider roads. In case your vehicle breaks down, place the 'Hazard Triangle' sign provided in your vehicle at 30 m in the front and behind the spot where the vehicle is stranded, with hazard lights and parking lights on (Figure 5.21).

e) Roll your vehicle to a straighter portion in case the breakdown spot is on/near a bend.

f) While driving on a hilly terrain, do not drive on clutch as you may lose control.

g) Do not drive for more than 2 hours at a stretch on hilly terrain. Relax for 15 minutes, drink lot of water, moisten your face, and start again.

h) Do not get distracted by the scenery. You need to keep your focus on the road. If you wish to view something, stop somewhere safe.

5.5 Eco Sensitive Zones (Forest, Protected Area, etc.)

The majority of the Eco-Sensitive Zones (ESZ) have their specific travel guidelines which are provided to you while entering such places. You should follow those area specific guidelines. In the absence of any area specific rules, you must follow some general guidelines for driving safely in eco-sensitive zones which are provided below.

Figure 5.22 Road signs to caution regarding animal movement

a) Make sure that all the windows and doors are closed. Beware of the animal movement in these zones (Figure 5.22).

b) Do not use horns unless indicated to do so. Do not play radio, loud music, etc. in your vehicle, while driving in these zones. Remember, the main objective is to move quietly without disturbing any animals passing by (Figure 5.23).

Figure 5.23 Road sign indicating horn prohibition

c) Be cautious about animals crossing the road. You should stop your vehicle as far as possible from the animal till it crosses the road. If necessary, always cross from behind the animals.

d) Follow the posted speed limit. Try minimising emission and noise pollution by driving in high gear at a uniform speed. Avoid sudden acceleration and deceleration.

e) You should not stop/park your vehicle in ESZs except in the case of emergencies.

5.6 Exercise Questions

1. **While driving, if it is indicated 'lane closure 200m ahead'. How will you merge into the open lane?**
   a) Take a turn immediately and change the lane
   b) Give turn indicator for 1 sec and merge into the adjacent open lane within 4 sec
   c) Give turn indicator for at least 5 sec and then merge into the adjacent open lane by taking another 10 sec at least after verifying the rear view and side mirrors
   d) Wait till the start of the lane closure and then merge abruptly into the adjacent lane
2. **While driving in construction zone, the basic principle is _____**
   a) Drive expecting the unexpected
   b) Always give way to uphill vehicles
   c) To see and to be seen (Improve the visibility of your vehicle)
   d) Drive silently
3. **While driving in inclement weather, the basic principle is _____**
   a) Drive expecting the unexpected
   b) Always give way to uphill vehicles
   c) To see and to be seen (Improve the visibility of your vehicle)
   d) Drive silently
4. **Safe following distance to be maintained in construction zones is____**
   a) 1 sec
   b) 2 sec
   c) 3 sec
   d) 5 sec
5. **When should you replace the tire?**
   a) When depth of tire tread is less than 1 mm
   b) When depth of tire tread is less than 2 mm
   c) When depth of tire tread is less than 3 mm
   d) When depth of tire tread is less than 8 mm

6. Safe following distance to be maintained in inclement weather is _____

a) 1 sec
b) 2 sec
c) 3-4 sec
d) 9 sec

7. Where to place the hazard triangle in case of vehicle breakdown on hilly terrain?

a) 10m ahead
b) 20m ahead
c) 30m ahead
d) 50m ahead

8. How to demist the fog inside the windscreen?

a) Turn on AC
b) Open the windows slightly for air flow
c) Turn on warm air in winters
d) All the above

9. Which vehicle has the right of way on a hilly terrain?

a) The vehicle driving uphill has the right of way
b) The vehicle driving downhill has the right of way
c) The vehicle moving fast has the right of way
d) The vehicle which used the horn first has the right of way

10. Type of headlights you should NOT use in Fog conditions is _____

a) Headlights at high beam
b) Headlights at low beam
c) Fog lights
d) All the above

11. Which of the following guidelines you need to follow while driving in complex situations?

a) Slow down the vehicles
b) Avoid any type of distraction
c) Drive defensively and maintain more distance between vehicles
d) All the above

CHAPTER 6

Vulnerable Road Users

Sudeshna Mitra
&
Dipanjan Mukherjee

6.1 Background

In general, all type of road users are at risk of being injured. However, there are eminent contrasts in fatality rates between different road user groups. Specifically, the “vulnerable” road users such as pedestrians, bicyclist, and two-wheeler users are at higher risk than vehicle occupants. Usually, the ‘vulnerable’ road users bear the greatest burden of fatality and injury. As a driver, you must be aware of the safety issues related to vulnerable road users.

Vulnerable road users are characterised as “vulnerable” mainly due to their exposure to the roadway in the absence of protective shell and safety measures. Moreover, the difference in mass between other vehicle and vulnerable road users is often a significant factor towards the fatality. The pedestrians and cyclists are predominantly known as vulnerable road users mainly due to their unprotected state. However, owing to the unstable nature of vehicle, motorcycle riders, pillion riders and non-motorized transport users are also known as vulnerable users. In order to ensure the safety of the vulnerable road user, it is important for you to follow various safety guidelines. Such guidelines which are pertinent to the safety of vulnerable road user are discussed in this Chapter.

6.2 Causes of Vulnerability

The major reasons for vulnerability are as follows.

a) Absence of protective shell and safety measures.

b) Smaller in size than regular vehicle and less visible to other road users.

c) More chances of being killed or injured when involved in a collision.

6.3 Types of Vulnerable Road User

Pedestrian, Bicyclist, Motor Cyclist, and other Non-Motorized vehicle (NMV) users are generally considered as vulnerable road users (Figure 6.1).

6.3.1 Pedestrians

Pedestrians are the most vulnerable among all road users because they lack the protection of a vehicle. As a driver, it is your responsibility, to do everything conceivable to stay away from the crashes involving a pedestrian. When you are driving in residential and business areas, you should be aware of the presence of pedestrians and drive slowly and attentively. It may be mentioned that in residential areas, the interaction between the vehicle and child pedestrian is expected

to be higher. Similarly, in business and commercial areas, people often move haphazardly on the street and cross the road in the middle of the traffic blockage or at intersections violating the traffic signal. However, as a driver, you must be cautious about such situations and drive slowly and carefully at these locations.

6.3.2 Bicycle Riders

Bicycle riders are considered to be vulnerable mainly due to the lack of protective shell and smaller size of the vehicle. The problem is much more severe at locations like intersections where sight distance is restricted. While overtaking a cyclist, you should allow an adequate gap between your vehicle and the bicycle. You should be tolerant to give them enough time to cross the road safely. It is also important for you to check the mirrors and blind spots for hidden bicyclists.

6.3.3 Motorcycle Riders

Motorcyclists are also considered under the group of vulnerable road users. The risk of fatality is much more due to a higher speed than other vulnerable road users. Safety accessories (helmet, boots, etc.) are important in reducing the severity of accidents for motorcycle riders. However, often it is observed that due to lack of awareness they do not use such accessories.

6.3.4 Other Non-motorized Vehicles (NMV)

Other non-motorized vehicles, for example, cycle-rickshaws, hand pull rickshaws, animal carts, and handcarts move slower than other motorized vehicles. This low-speed nature of NMV often causes inconvenience to other vehicles and sometimes, leads to accidents. It may be mentioned that most of the fatalities involving NMV are at crossings or intersections. The possible reasons are (i) NMV users are unable to judge the situation, (ii) Motorised vehicle users misread the speed of NMV, and (iii) Motorized vehicle users often overlook the NMV. As a responsible driver, it is your duty to be considerate to the NMV users.

It is worthwhile to mention that even on highways where mobility is the first priority, often you will pass through some suburban areas. In such locations, there will be an interaction between pedestrians or other NMV and motorized vehicles. So, you need to be more cautious while driving through such congested locations.

Figure 6.1 Different types of vulnerable road user

6.4 Common Reasons behind Collisions with Vulnerable Road Users

Although there are many reasons for collisions involving vulnerable road users, a few are discussed in this section. Intersections are often considered as the most hazardous location for the pedestrians or the cyclists because of restricted sight distance. As a driver, you should drive carefully and with courtesy while driving through such areas. It is important for you to know the following issues so that you can drive safely protecting the vulnerable road users (Table 6.1).

Table 6.1: Common issues of vulnerable road users

Vulnerable Road Users	Common Issues	How can you help the Vulnerable Road Users?
Motorcyclists	i. It may be difficult to see them, especially at intersections. ii. They often move very fast. iii. In general, motorcycles are less stable than other vehicles. iv. It is difficult to perceive how close a motorcycle is to a vehicle.	i. You should give them enough time to cross the road safely. ii. You should give them enough room while overtaking or passing. iii. You must check your mirrors and look along your shoulder to cover the blind spots for motorcyclists. iv. You should be watchful of motorcyclists at roundabouts. v. You must take extra care when pulling out of the intersection and always recheck for motorcyclists.

Vulnerable Road Users	Common Issues	How can you help the Vulnerable Road Users?
Cyclists	i. It can be difficult to see a bicyclist, especially at an intersection. ii. They have a tendency to wobble and are easily affected by side winds while being overtaken. iii. In general, they are more vulnerable at roundabouts. iv. They cannot move very quickly. v. In general, they have a tendency to ride away from the kerb to avoid drains and debris.	i. You should give them enough time to cross the road. ii. While overtaking, you should give them enough space. iii. You should check your mirrors and blind spot. iv. You must be careful that your nearside is clear when turning and at roundabouts. v. You should respect cycle lanes and stop lines. vi. You should not overtake cyclists at intersection.
Pedestrians	i. Pedestrians such as children and elderly are often unable to judge the speed and intentions of the vehicle. They are easily distracted and may rush into the road without looking both sides of the road. ii. Pedestrians often use smart phones, tablets, MP3 players while walking. iii. The decision-making process of old people are generally slower than other pedestrians due to difficulty in perceiving the critical situation, poor vision and poor hearing ability. Their walking speed is relatively less, and they need more time to cross the road.	i. You should give them enough time and sufficient space to cross the road, especially for children, elderly and disabled pedestrians. ii. You must be ready for any unexpected event. iii. Do not park your vehicle on the footpath. iv. Stop your vehicle well before pedestrian crossings. v. You must slow down your vehicle in school zones, near hospitals residential areas, and marketplaces. vi. You should alert the pedestrian (use horn) if they are in the main carriageway blocking the vehicle path.

6.5 If You are a Vulnerable Road User

It is important for other road users to be considerate towards vulnerable road users. On the other hand, it is also important for the vulnerable road users to follow the safety guidelines for safe road use. While this guideline is prepared primarily for the drivers, at some instances driver himself/herself is a vulnerable road user (say, when he/she is walking from a parking lot, or using a bicycle or motorcycle). Also, as a driver, you may carry children or old people in your vehicle to drop them at some location. In such cases, it is your duty to advise them to follow the safety guidelines of the road. Therefore, this section deals with various safety guidelines for vulnerable road users and give drivers the opportunity to educate themselves as well as others.

6.5.1 Safety Guidelines for Pedestrians

In order ensure safety while walking, keep the following guidelines in mind.

a) You should cross only at designated crosswalk facility (Figure 6.2).

b) Sometimes designated crossing facilities are located far from the bus stop. In such cases, you should not hesitate to walk a while to access the facility and cross the road safely. If there is no such designated facility, you should look for a safe gap to cross the road.

c) You should never walk on the main carriageway.

d) You should not “Drink and Walk”.

e) You should never use your mobile phone while crossing or walking on road (Figure 6.3).

f) While walking on the street, you must be alert especially at critical locations such as intersection, curve, corner, etc.

Figure 6.2 Pedestrians at zebra crossing

Figure 6.3 Do not use your mobile phone while crossing the road

g) While walking with children, you should hold their hands firmly.

h) You should always walk on the footpath (Figure 6.4).

i) In the absence of footpath, walk as close to the kerb as possible or on the shoulder facing the oncoming traffic as shown in Figure 6.5.

j) Do not rush into the middle of the road.

k) It is preferred to wear light coloured clothes during night time or poor daylight conditions. This will improve visibility of other road users towards you.

Figure 6.4 Pedestrian on footpath

Figure 6.5 Pedestrian facing oncoming traffic

6.5.2 Safety Guidelines for Motorcyclists and Cyclists

The following are the safety guidelines for Motorcyclists and Cyclists.

a) You must wear a helmet while riding a motorcycle (Figure 6.6).

b) You must use the cycle lane or motorcycle lane wherever it is provided. However, in the absence of such lanes, ride on the left side maintaining a safe gap from the edge of the road, without interrupting motorized vehicles.

c) You should never ride your cycle on a pedestrian footpath (Figure 6.7).

d) You should have mirrors on your bicycle or two-wheeler.

Figure 6.6 Pillion riders on road with and without helmet

e) You must maintain a safe lateral and longitudinal distance from other vehicles.

f) It is very common among young motorcyclists to drive recklessly. You should always ride within the limits of your skill and ability. In all cases, you must respect the posted speed limit.

(g) You should always use retro-reflective stickers on your bicycle. The presence of such stickers will make you more visible to the other road users, especially at night time or poor daylight conditions.

Figure 6.7 Bicyclist on footpath

6.5.3 Safety Guidelines for School Children

School children are a special group of road users who are vulnerable due to their mental immaturity. As a driver often you may have to carry school children in your vehicle or have to interact with them on the road. Being a responsible driver, it is your duty to check for the presence of school children on the road. You should be more careful near school zones. Safe road use habit for school children and safe vehicle use for drivers near school area are discussed below.

a) You should slow down while driving in a school zone. Normally posted speed limits are mention near schools. Even in the absence of a sign, you should slow down your vehicle.

b) When school children are crossing, you should always yield or give way to school children.

c) When a school bus is stopped for pick-up or drop-off, you must not overtake the school bus. You should come to a complete stop and wait for the school bus to start.

d) School children should always walk on the footpath. In the absence of footpath, they should use the extreme right-hand side of the roads facing oncoming traffic.

e) School children must follow traffic signals while crossing the road. It is also important for them to use crossing facilities such as zebra crossing, pedestrian underpass, foot over bridge, etc. Figure 6.8 shows both right and wrong ways of crossing the road.

f) School children should always cross the road in front of their stopped school bus and look for traffic coming from behind. It is very important that they cross under the supervision of an adult person (Figure 6.8).

g) School children should not run or rush into the road.

h) School children should never cross a road at a corner or curve in the absence of signal or proper crossing facilities. Curves or corners are considered as hazardous locations because of poor visibility and inadequate sight distance.

Figure 6.8 School children on road

6.11 Exercise Questions

1) Who are vulnerable road users?

a) Pedestrians
b) Bicyclists
c) Motorcyclists
d) All the above

2) Why are pedestrians vulnerable?

a) They move very fast
b) They do not obey traffic rules
c) They are not protected by a vehicle
d) None of the above

3) Who are the most vulnerable in traffic?

a) Bus Drivers
b) Passengers of public transport
c) Motorcyclists
d) Pedestrians

4) What are the common reasons behind collisions with vulnerable road users?

a) Failure to judge other person's path or speed
b) Poor turn or manoeuvre at intersections
c) Both a and b
d) Slow down before a pedestrian crossing

5) As a driver, how can you help pedestrians?

a) Give them time and space to cross, especially the elderly or disabled
b) Do not park your vehicle on the footpath
c) You must slow down near school, hospital crossing, etc.
d) All the above

6) What are the common issues with cyclists?

a) It can be difficult to see a bicyclist, especially at an intersection
b) They cannot move off very quickly
c) Both a and b
d) Often they move very fast

7) Which among the following causes a safety hazard for pedestrians?

a) Using mobile phone while crossing
b) Following the pedestrian phase at signalised intersection
c) Using zebra crossing
d) Using footpath

8) Which among the following causes a safety hazard for motorcyclists?

a) Driving without helmet
b) Maintaining a safe distance between other vehicles
c) Wearing protective riding gear
d) All of these

9) As a driver, what should you do in school zone?

a) Slow down the vehicle
b) Be watchful
c) Both a and b
d) None of the above

10) You are about to reverse into a side road. A pedestrian wishes to cross behind you. You should _____

a) Wave to the pedestrian to stop
b) Give way to the pedestrian
c) Wave to the pedestrian to cross
d) Reverse before the pedestrian starts to cross

CHAPTER 7

Alertness and Attitude

Sudeshna Mitra
&
Sudipa Chatterjee

7.1 Background

Good driver behaviour with a positive attitude is one of the key requirements for safe driving. As you drive, you will make many choices depending on the situations, and your driving choices will have many consequences. Safe driving attitude is important because it helps you to take the right decisions, to control your emotions and behaviour, and to drive defensively. Thus, alertness and safe driving attitude are essential for you to ensure your safety as well as the safety of other road users. In order to develop a safe driving behaviour and attitude, you need to know the following aspects.

a) **Anticipation**–You need to think well in advance about what other road users may do next and be ready for an appropriate action.

b) **Concentration**–You need to focus on driving task and understand the actions of other road users while driving.

c) **Distraction**–You should not be absent-minded and should not divert your mind to other tasks while driving.

d) **Ethical Behaviour**–You need to maintain certain standards of ethics while driving.

e) **Courtesy**–You need to maintain good behaviour and positive attitude and habits as a driver.

f) **Road Rage**–You should not be aggressive or show anger towards other drivers while driving.

The present Chapter includes a detailed discussion of aforementioned factors to develop a safe driving attitude. It also explains why these factors are important in the context of safe driving.

7.2 Anticipation

Anticipation refers to expecting something which will or might happen on the road (any road hazard which requires slowing down the vehicle, changing direction, etc.). Steps for effective anticipation are discussed below.

a) **Look**: It is important for you to observe the road ahead carefully. Looking further ahead will enable you to see the things in advance, and it gives you some decision time to take appropriate measures against any hazard that may

occur. You should also check your mirrors and blind spots regularly to ensure safe gap. Always try to gather more information from the surroundings. The more you gather information, the more you are prepared to save yourself and onboard persons from the hazard on roads, if any.

b) **Assess**: You should assess and judge the situation very well to identify the presence of any safety issues. If there is any hazard, think of alternative actions to be adopted in such situations.

c) **Decide**: Finally, you should decide appropriate action based on the following questions.

- What can be seen?
- What may not be seen?
- What you can sensibly anticipate for other road users to do?

For example, while driving in the car, you can see a cyclist heading towards the intersection carelessly (Figure 7.1). After weighing the whole situation, you identify the hazard and think for an appropriate action (either stop or reduce the speed). Finally, depending on your surroundings, you decide on which action you should take to avoid the hazard.

Figure 7.1 A context of anticipation

7.2.1 Features to Pay Special Attention

While driving, you should pay special attention to the following:

- Other road users such as pedestrians, motorcyclists and bicyclists, etc.
- Hand Signals or indications given by other road users
- Road signs and markings
- Type and condition of the road
- Parked vehicles
- Emergency vehicles
- Animals on road

7.2.2 Period and Locations to be Extra Careful

The complexity of driving often varies depending on time and location. This section deals with those period and locations where you need to pay more attention.

a) **Rush hours** – It is common that people take more risks while driving in the rush hours. This sometimes leads to loss of attention and irresponsible driving. Hence, it is important for you to be cautious especially during rush hours.

b) **School zones**– Often you will find many schools are located on both sides of the main roads. In general, school children are not good at judging the situations and taking appropriate actions when needed. They may not be able to perceive the speed of the vehicles, may rush into the roads, and get caught in the middle of the roads. Hence, it is your duty to pay special attention near school areas to avoid any probable hazards.

c) **Parking zones** – In general you should give hand signals or indications when pulling out of a parking zone. Sometimes you may find vehicles leaving the parking lots without giving a proper indication, which may pose a danger to other road users. It may also be mentioned that parked vehicle sometimes restrict the view towards other road users, especially the crossing pedestrians. Therefore, you need to be careful and drive slowly near parking zones.

d) **Construction Zones** – Driving near construction zone is challenging. You may find a sudden change in direction, workers on the road, limited road space, etc. at construction zones. In such situations, you need to drive carefully and slowly, following the informatory signs provided at a construction zone. Safety guidelines to be followed at construction zones has been discussed in detail in Chapter 5.

e) **Intersections and Roundabouts** – Intersections are the locations where vehicles meet from different directions. As a result, several vehicular conflicts are possible at intersections. The problems are much severe at the uncontrolled intersections where neither traffic police nor signals are present to control the vehicular/pedestrian movements. Therefore, as a driver, you need to slow down and drive carefully near intersections.

7.2.3 Guidelines to Improve Your View

To improve your view, you should take care of the points mentioned below.

- Following too closely behind a vehicle can significantly reduce your view. You should pull back to allow a clear view ahead. Follow a two-second rule and make sure you do not reach the same spot as the vehicle ahead of you in less than the time taken to say “One Thousand One and One Thousand Two”.
- In case of a sharp curve (where you cannot see the curve due to inadequate sight distance), you need to look at rows of trees or lamp posts along the road ahead. This will help you to understand the presence of a curve and take appropriate actions to negotiate the curve safely.
- Sometimes, you should not depend on vision alone. In haze or at a visually impaired intersection, lower down the window glass and listen for the sound of approaching vehicles.
- There are many other factors, such as weather conditions, road conditions, etc., which may affect your ability to anticipate the unexpected.

7.3 Concentration

Concentration is the key to driving safely. Lack of concentration is one of the major causes of accidents. Since driving is often not considered a challenging job, especially for experienced drivers, drivers are susceptible to losing concentration. Driving is to a great extent an automatic behaviour which stimulates the desire to do something else other than driving. However, a traffic situation can change suddenly, which makes it essential that you are consistently mindful and paying attention.

7.3.1 Reasons for Lack of Concentration

There can be many instances where you lose your concentration while driving. It is important for you to be aware of the reasons of poor concentration so that you can improve concentration while driving. The major reasons for poor concentration are as follows.

a) Multitasking while driving: making a phone call, tuning the radio, listening to the radio, talking to a passenger, or eating while driving, etc.

b) Attention is diverted from driving by noticeable things and events inside or outside the car. For example, an accident on the other lane, a striking person on the pavement, a conspicuous billboard alongside the road, children fighting in the school bus, etc.

c) Physically or mentally tired.

d) Preoccupied with other things, or daydreaming without being fatigued.

7.3.2 Consequences of Poor Concentration

When you lose concentration, it may, for instance, cause:

a) Longer reaction times, like, taking more time to apply brakes or make any decision.

b) Poor observation of the surrounding which may lead to overlook important information on the road such as signboard, signal, etc.

7.3.3 Measures to Regain Concentration

When you lose concentration while driving, the following measures will help you to regain the concentration.

a) Open windows to increase the oxygen supply to the brain.

b) You should stop for regular breaks.

c) Drink water and/or energy drinks at regular interval to keep yourself hydrated.

d) You may take chewing gum to increase your focus while driving.

7.4 Distraction

Distraction is a specific type of concentration loss that occurs when driver's attention is diverted from the driving task to a different activity. It is worth noting that distraction is a type of inattention. It also includes fatigue, physical conditions of the driver, and emotional conditions of the driver. Driving is a skill that requires

your full attention to control your vehicle safely and respond to events happening around you. Distractions are anything that takes your attention off the primary task of driving.

7.4.1 Types of Distractions

Three types of distractions are generally observed on the road (Figure 7.2).

a) Visual Distractions: Any distraction that takes your eyes off the road.

b) Manual Distractions: Any distraction that takes your hands off the steering wheel.

c) Cognitive Distractions: Any distraction that takes your mind off the driving task.

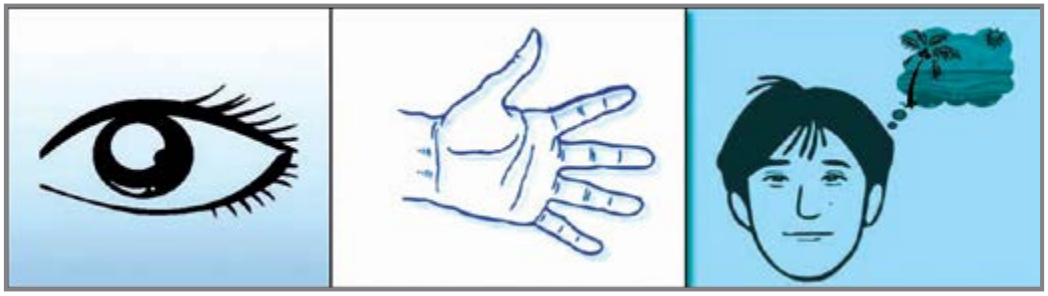


Figure 7.2 Types of distraction

7.4.2 Common Distractions

All distractions can be dangerous and life threatening but texting while driving is one of the most dangerous distractions because it involves all three types of distractions mentioned in Section 7.4.1. Other examples of common distractions are:

- Using a cell phone
- Eating and drinking
- Talking to passengers
- Grooming
- Reading (looking at the map)
- Using navigation system
- Watching a video
- Changing the radio station, CD, etc.
- Listening to loud music

Some of these common distractions are shown in Figure 7.3.

Figure 7.3 Examples of common distractions

7.4.3 Managing Distractions

When you apply the brake, it takes some distance and time to bring the vehicle to a complete stop or to change your path to avoid a hazard. If you are unmindful, it will take longer time for you to stop as you need more time to react. You should have an idea about how distractions affect both the distance and time. The various methods to control distractions are as follows.

a) You should be well-rested and should be in the appropriate mindset to drive. Driving when you are upset or angry is as dangerous as driving when you are tired.
b) You should pre-plan your trip including choice of route and directions, checking for a fuel stop, checking the route map, etc.
c) You should adjust mirrors beforehand.
d) You should either turn off or keep the cell phone in silent mode while driving.
e) You may take a break when you feel tired or hungry.
f) You should not be distracted by the passengers in the car.

7.5 Ethical Behaviour

The ethical behaviour of a driver is defined as standards of courtesy while operating a vehicle. Good drivers tend to care more about driving ethics, and therefore, experience fewer instances of poor or heedless driving. In order to develop ethical driving, you need to abide by the guidelines mentioned in Chapter 4.

7.6 Courtesy

Courtesy means showing politeness in your attitude and behaviour towards other road users. Attitude here means thinking about possible actions of other road users and adjusting your behaviour, and avoiding aggression while driving.

7.6.1 Aspects of Courtesy

Some common aspects of road courtesy are as follows (Figure 7.4).

a) **Respect:** You should respect others, their property and privacy. The behaviour which expresses these values includes how your actions affect others. You should act unselfishly and help others. You should always acknowledge a courteous act by another driver.

b) **Interactions between road users:** The way you think decides your emotions. Your emotions affect your attitude towards driving and other road users. You should share space with other road users graciously.

c) **Psychological measurements:** Always try to be tolerant to other driver's mistakes. You must not be upset or agitated when other drivers make mistakes.

d) **Patience:** You should not unnecessarily blow horns in a traffic jam or when the preceding car remains stationary at a traffic signal even after the signal has turned green.

Figure 7.4 Common aspects of road courtesy

e) **Considerate:** Always be helpful and considerate on roads. You should allow a pedestrian to cross the road and recover from an accident. Always give way to ambulance and fire rescue services.

f) **Responsible citizen:** Always ask yourself before taking action that affects someone. You should always give indications before taking turns. Even when you scrape the fender or inflict minor damage to a parked car in the absence of its owner, you must apologise and leave a note giving your name and telephone number.

7.7 Road Rage

Road Rage is a violent or angry behaviour by a driver which includes rude gestures, physical threats or any kind of dangerous driving methods targeted towards another driver in an effort to intimidate or release frustration (Figure 7.5). Sometimes, it can lead to fights, assaults and collisions that result in serious physical injuries or even death. If you have been passed from the wrong side, tailgated, and cut off the lane path by other vehicles, then you have been accosted by an aggressive driver. Aggressive driving often ends in car crashes and ridiculous individual attacks. All these reasons justify the importance of knowing how to stop road rage before it happens and saves you from a car accident.

7.7.1 Causes of Road Rage

Following are the common causes of Road Rage.

- Heavy traffic
- Feeling stressed
- Construction delays or detours
- Distracted driving
- Loud music
- Slow driving
- Aggressive driving behaviour
- Sudden acceleration or braking
- Making obscene gestures to other drivers
- Tailgating or deliberately following the driver in front of you too closely
- Changing lanes too quickly
- Overusing the car horn
- Headlight flashing

- Cutting others off in a lane
- Deliberately preventing someone from merging
- Blocking others from leaving their parking lot
- Chasing other motorists
- Yelling or exhibiting troublesome behaviour at road environment
- Intentionally causing a collision between vehicles
- Hitting other vehicles plying on the road
- Launching assault on other motorists, their passengers, cyclists, or pedestrians
- Exiting the car in an attempt to provoke confrontations

Figure 7.5 Example of road rage

7.7.2 Tips to Avoid Road Rage

Here are the three tips to avoid road rage.

a) Do not offend other road users

- Before merging your vehicle, you need to check for suitable gap.
- Use indicator to show your intentions before making a move.
- When you merge, use turning indicators to show your intention before making a turn. If you make a mistake, try to apologise to the other driver with an appropriate gesture.
- If someone cuts your path in front of your vehicle, please slow down your vehicle and give him/her space to merge into your lane.

- You should not tailgate. Allow at least a 2-second gap between your vehicle and the other vehicle.
- If you think another car is driving slower than necessary and you are unable to pass, pull back and allow more space and then try to pass by.
- You should always be able to notice the headlights of the car behind you in your rear-view mirror.

b) Do not engage

- You should always try to keep yourself away from creating any conflicting situation.
- If you are still pursued by an angry driver, try to approach a traffic guard or a police station.
- You must take a break and relax. You should be cool minded and stress free.

c) Adjust your attitude

- Do not compete with other drivers. You should remember that driving is not a competition.
- Do not allow the shortest possible time for a trip and then race the clock; instead allow more time for your trip.
- You should stay calm and do not agitate yourself on fellow drivers' actions. Realise the incident from fellow drivers' point of view.
- You may work on stress reduction and anger management techniques.

7.8 Exercise Questions

1. **When you are moving off from behind a parked car you should_____**
   a) Look around before you move off
   b) Use all the mirrors on the vehicle
   c) Give a signal if necessary
   d) All the above
2. **Which of the following may cause loss of concentration?**
   a) Loud music
   b) Arguing with a passenger
   c) Using a mobile phone
   d) All the above
3. **When emerging from an intersection, which is most possibly to obstruct your view?**
   a) Windscreen pillars
   b) Steering wheel
   c) Interior mirror
   d) Windscreen wipers
4. **You are waiting to take a right turn from the end of a road. Your view is obstructed by a parked car. What should you do?**
   a) First stop and then move ahead slowly and cautiously for a proper view
   b) Move fast to where you can see so that you only block traffic from one direction
   c) Wait for a pedestrian to let you know when it is safe for you to emerge
   d) Turn your vehicle around immediately and find another junction to use
5. **Before you make a U-turn on the road, you should _____**
   a) Give hand signal as well as use your indicators
   b) Signal so that other drivers can slow down for you
   c) Before turning look over your shoulder
   d) All the above

6. On a long journey, boredom can cause you to feel sleepy. You should _____

a) Leave the roadway and find a safe place to stop

b) Keep looking around at the surrounding landscape

c) Open the window to get fresh air

d) Both a and c

7. You are driving at night on a dimly lit road behind another vehicle. You should _____

a) Flash your headlights

b) Use dipped beam headlights

c) Switch off your headlights

d) Use full beam headlights

8. Which of the following causes road rage?

a) Taking breaks

b) Waving hand

c) Cutting lane

d) Using seat belt

9. How can you avoid road rage?

a) Do not offend other road users

b) Tailgating other vehicles

c) Overtaking other vehicles

d) Overusing horn

10. Which of the following does not come under ethical behaviour of driving?

a) Follow traffic rules

b) Use seat belts

c) Respect traffic rules and signals

d) Drink-and-drive

CHAPTER 8

Accidents and Emergencies

Arkopal Goswami
&
Dipanjan Nag

8.1 Background

Safety is a major concern for all road users ranging from vehicular modes to the pedestrians, and as a driver, you should drive safely and responsibly to avoid an accident. However, emergencies are unpredictable, and, in such situations responses could be rehearsed and perfected to best manage an unexpected situation and, maybe, save lives. This Chapter will guide you through the following aspects and help you to practice your response in case of an emergency.

a) Involvement in an accident

Involvement means any individual who is a witness to an accident or emergency. This section will provide the guidelines for you to follow under such a situation.

b) First visitor

First visitor means the first person to arrive at the scene of an accident, injury or emergency and to assess the situation and arrange for assistance. The first person on the scene may or may not be a first aid officer or person trained in first aid.

c) Vehicle breakdown

Major sources of unexpected incidents are vehicle breakdown which refers to the failure of a vehicle (mechanically or from its surroundings) to operate properly leading to little or no mobility. Such a breakdown affects the driver and other road users. Examples are brake failure, stuck accelerator, collision with other vehicles, etc.

d) Response to emergency vehicle

Response is in terms of the reaction of other road users to an emergency vehicle (for example an ambulance). This section will define the things you need to do when an emergency vehicle is seen trying to attend to an emergency.

e) Driving during emergencies

When confronted with an unexpected situation, you will have to use the skills of steering, acceleration and braking, individually and in combination to face the emergency situation successfully.

8.2 Things to do When Involved in an Accident

It is common to be surprised by an unexpected event, but there is a need to be decisive and take strong actions to best help the victims of the incident. You could be involved directly or indirectly in the situation, but it is desirable that you take the following few steps which are the most rational things to do in such a situation (Figure 8.1).

Figure 8.1 Things to do when involved in an accident

Figure 8.2 Avoid obstructing the road

8.2.1 Stop

Stop your vehicle at or near the scene of accident. If you can, move your vehicle off the road, so that you do not block the traffic (Figure 8.2).

8.2.2 Assist

To assist the victims of a road emergency, the following things should be done.

a) Notify the police if the accident involves death or injury. Also, call the police if any vehicle is damaged to the extent that it requires towing.

b) If the drivers of the cars are hurt and are not in a position to notify the police, then others involved in the accident must call for help.

c) Switch off the ignition of crashed vehicle to reduce chances of fire.

8.2.3 Exchange Information

When you are involved in an accident and a trained first aid officer or a healthcare professional arrives at the scene, give them all the information that you know about the incident and the casualty's condition. Exchange the names and addresses of all people involved in or related to the accident. If the accident involves a parked car, try to find the owner of the car. If you cannot leave a note in a place where it can be seen, then notify the police. The note should contain:

a) Your name and address

b) Your driver's license number

c) Date and time of the accident

d) Your insurance company's name and your policy number

8.2.4 Post-Crash Assistance

Post-crash assistance is the help that is offered by you after the accident. After being involved in an accident, it is a crime not to assist and exchange information in such a situation in countries like UK, Australia, and Japan. In India too, stricter laws on this matter would soon be placed. Following is what you should do as a part of that assistance.

a) Help anyone who has been injured.

b) Protect the area to make sure that another crash does not occur.

c) Provide first aid before emergency vehicles arrive.

8.3 Responsibility of First Visitor to the Accident Spot

If you are the first to arrive at the scene of an accident, then you MUST take the following steps (Figure 8.3).

8.3.1 Assess the Situation

a) You should assess the situation quickly.

b) Check if there is any danger to yourself, the injured person or others before giving any assistance.

c) If safe to do so, remove the danger or remove the injured from danger.

8.3.2 Identify the Injury

a) You should check if the injured is conscious or unconscious.

b) Check if the injury is fatal or non-fatal.

c) Look if the injured person needs urgent medical attention.

Figure 8.3 Responsibility of the first visitor

8.3.3 Arrange for Assistance and/or Emergency Services to Attend

a) Call local police, traffic guards or the emergency hotline.
b) If unable, ask the nearest available person to help.

8.3.4 Avoid Moving the Victim

a) Remember that many injuries are not visible on the skin. Unless the victim is in danger due to fire or other hazards, leave the person in place until emergency services arrive.
b) Approach a victim by kneeling down to his/her level. Otherwise, it may send the victim into a panic and may also cause further injury.

8.3.5 Stay and Assist the Casualty as Best until Help Arrives

a) If you are trained in first aid, render assistance as per your training (Figure 8.4).
b) If you are not trained in first aid to keep the injured safe and calm, keep a close watch on their condition and request assistance from others at the scene.

Figure 8.4 An example of trained assistance

8.3.6 Give Further Assistance if Necessary or as Directed

If you are requested by a trained first aid officer or healthcare professional to give additional assistance, follow their instructions as required. A health care professional will inform you when to leave the scene.

8.4 Knowing about Various Vehicle Breakdown

8.4.1 Breakdown on the Road

You should approach a broken-down vehicle or crash scene with caution, but do not allow yourself to be distracted from the road. Look out for pedestrians.

If your vehicle breaks down on the road in an exposed position:

a) Activate the hazard warning lights immediately.

b) Wear bright or reflective safety vest (Figure 8.5).

c) Lead the occupants of the car to safety.

Figure 8.5 A reflective safety vest

Figure 8.6 Reflective road signs to give warning about disabled vehicle

d) If the vehicle is disabled, it is important to give warning to other road users. They may be warned by using red flags, reflective hazard triangles or red lanterns (Figure 8.6).

e) Such reflective red triangles should be placed about 30m (around 40 steps) behind the broken-down vehicle.

8.4.2 Brake Failure

If the car does not slow down or stop after pushing the brake pedal, then you are experiencing brake failure. If this happens, you should follow these steps.

a) It is helpful to pump the brake pedal hard and fast (Figure 8.7).

b) Move to a lower gear whether you are driving a manual or an automatic vehicle.

c) If necessary, use your horn and/or flash your headlights to warn other drivers (Figure 8.8).

d) Move to the side of the road.

e) Carefully stop your vehicle using the handbrake.

Fig 8.7 Pumping the brake pedal

Figure 8.8 Using horn and/or flash lights

8.4.3 Tyre Blow-out (Rapid Puncture)

A front wheel puncture will pull your vehicle in the direction of the puncture. For example, if the puncture is on the right front tyre, the vehicle will be pulled to the right. A rear wheel puncture (Figure 8.9) will tend to cause your vehicle to turn sharply from side to side. Tyre blowouts occur without any prior warning, but preceded by thumping sound. Hence it is very important that the tyres are in good condition and properly inflated.

If a puncture occurs:

a) Keep a firm grip on the steering wheel.

b) Do not over-steer to correct any sudden change in direction or pull.

c) Gradually take your foot off the accelerator.

d) Once you have gained better control of the car, gently apply the brakes.

e) Slow down, pull over to the side of the road, and stop in a safe spot.

Figure 8.9 Rear wheel puncture

8.4.4 Headlight Failure

In the case of a headlight failure, you should try the following.

a) Turn on the dimmer switch– it may turn on the headlight again.

b) Switch the headlights on and off a few times.

c) Turn on the parking lights, emergency flashers or turning indicators.

8.4.5 Stuck Accelerator

If the accelerator pedal is released to reduce speed, but the car continues at the same speed or accelerates, the accelerator is stuck. Under such a crisis, you should attempt the following.

a) You must press the brake firmly. Do not use the handbrake.

b) Shift the transmission into neutral.

c) Turn the engine off - only if all else fails.

d) Bring the car to a complete stop to the side of the road (Figure 8.10).

Figure 8.10 Car brought to a complete stop in case of stuck accelerator

8.4.6 Forced on to the Road Shoulder

If you have been forced on to the edge of a road, do not rush to get back on to the road, instead:

a) Keep a firm grip on the steering wheel and drive in a straight line.

b) Slow down and check traffic before you enter the road again.

8.4.7 Protecting Yourself in Collision

Under any circumstances, you must be wearing the seatbelt at all times while driving. The advantages of wearing a seatbelt during a collision are discussed below.

a) It will keep you from being thrown out of the car.

b) The car stops at impact, but its occupant keeps moving and is most likely to be stopped by the dashboard or windshield. To avoid this, seatbelts are very effective.

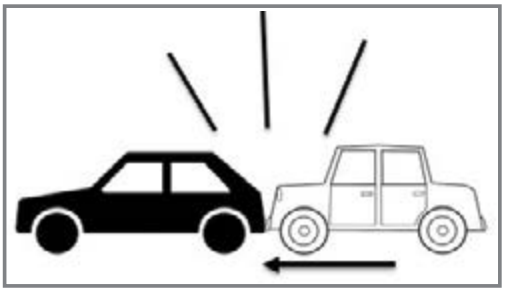


Figure 8.11 Car hit from the rear

The collision can take place from any direction. Your precautionary steps during some common types of collision are mentioned below.

Being hit from the rear (Figure 8.11)

a) Steer away from opposing traffic.

b) Brace yourself between the steering wheel and the seat back; make sure that their is no gap between head-rest and head (Figure 8.12).

Being hit from the side (Figure 8.13)

a) Brace yourself with the steering wheel to keep from being thrown against the side of the car.

Figure 8.12 No gap between head-rest and head

Figure 8.13 Car hit from the side

Being hit from the front (Figure 8.14)

a) Throw yourself across the seat, so that you do not hit the steering column or the windshield.

b) For the same reason, seatbelts are very important for your safety. Otherwise, you are in risk of hurting your neck.

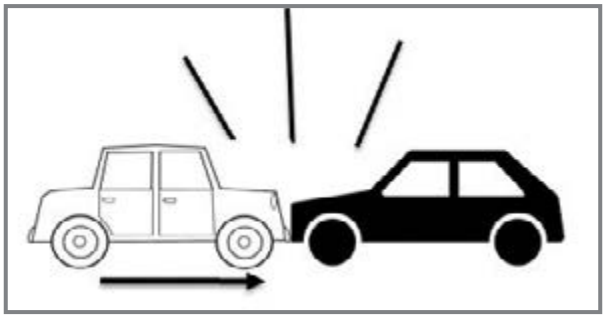


Figure 8.14 Car hit from the front

8.4.8 Car Fire

Most vehicle fires (Figure 8.15) are caused by a short circuit in the electrical system. If this happens:

a) You should slow down, stop and turn off the ignition.

b) Get all passengers out of the car and away from the fire.

c) If the fire is beyond control, move away – petrol may cause an explosion.

d) If you have an appropriate extinguisher, use it to put out the fire.

Figure 8.15 Fire due to short circuit

e) If you do not have an extinguisher, try to extinguish the flames with a thick cloth or garment, sand or dirt, and do not use water.

f) Try to isolate and remove the cause. Disconnect the battery quickly, if possible. If this is not possible, tear away the burning wires with a handy instrument. You should never touch burning wires or insulation with your bare hands.

8.5 Response to Emergency Vehicle

8.5.1 Approaching Emergency Vehicle from Behind

a) Turn off your music which will help in concentrating your next move.

b) Indicate that you are making way for the vehicle – move aside to the left.

c) Do not drive on the sidewalk/footpath which will be a hazard for the pedestrians (Figure 8.16)

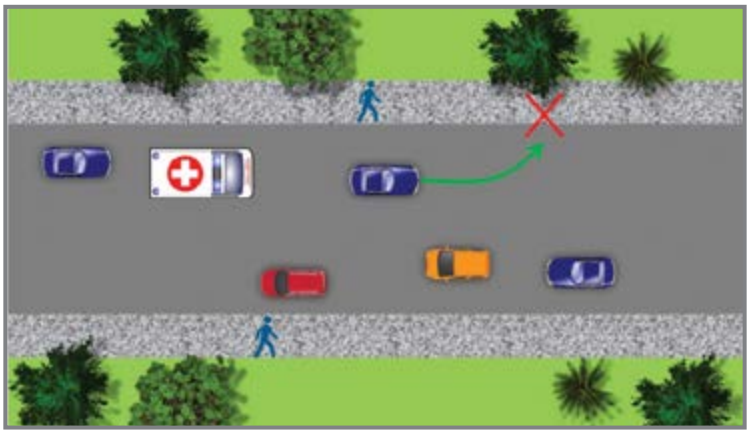


Figure 8.16 Do not drive the car on the footpath

8.5.2 Approaching Emergency Vehicle at Intersection

a) Always maintain a safe distance from the emergency vehicle. Use the rearview or the side-view mirrors.

b) Never violate a red light while following an emergency vehicle unless directed by the authority.

8.6 Different Driving Emergencies and Useful Procedures

8.6.1 Steering

Good steering skills are essential to maintaining control of your vehicle. Often in an emergency, you must react quickly and correctly to avoid an accident. To steer quickly, you must hold the steering wheel correctly, which is the 9 O' clock and 3 O' clock hand position. Get used to handling steering wheel in this position all the time to turn quickly and avoid any obstacle, follow the steps shown in Figure 8.17.

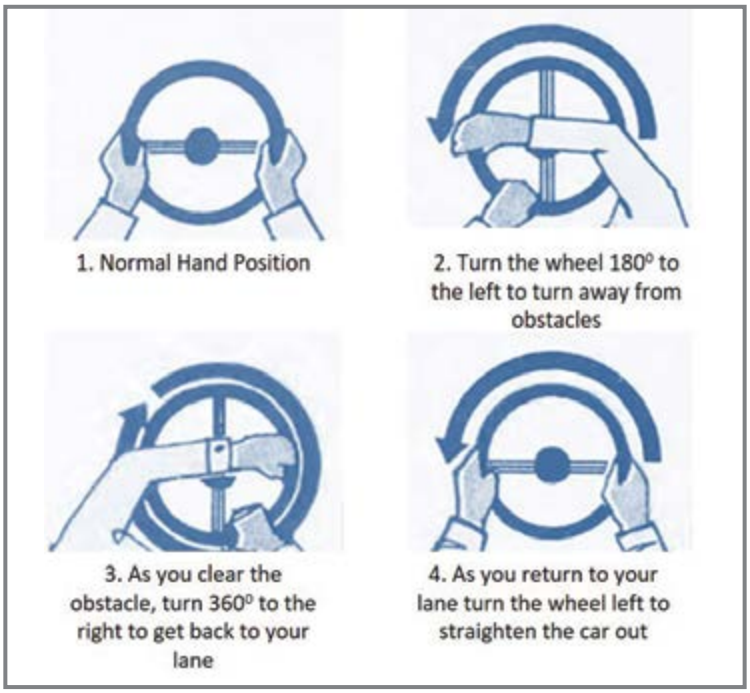


Figure 8.17 Steering procedure to avoid obstacle

8.6.2 Accelerating

At times you have to accelerate to avoid an accident. For example, if another car is about to hit you from the side or from behind, you must speed up to avoid a collision (Figure 8.18).

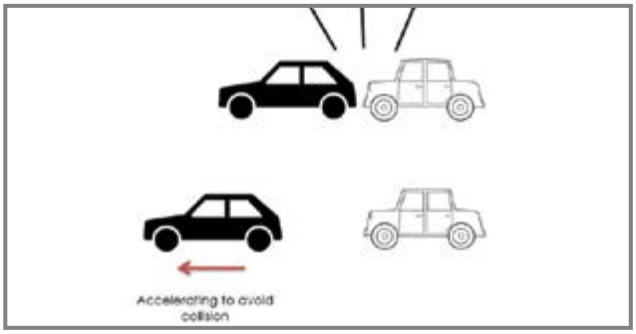


Figure 8.18 Accelerating to avoid collision

8.6.3 Braking

While braking is often an essential response to driving emergencies, using your brakes inappropriately can actually cause an accident. In emergencies, many drivers attempt to strongly push the brake pedal. This locks the brakes, causes the car to skid and makes it impossible to steer. Pumping the brakes is generally the best way to stop. By doing so, the car stops quicker and you maintain your steering control. This improves your chances of avoiding a collision.

8.6.4 Skidding

Causes of skids

A skid does not just happen. It is almost always the result of a driver's actions, such as:

a) Sudden or excessive braking
b) Harsh acceleration
c) Coarse or uncontrolled steering
d) Excessive speeding on curves (Figure 8.19).

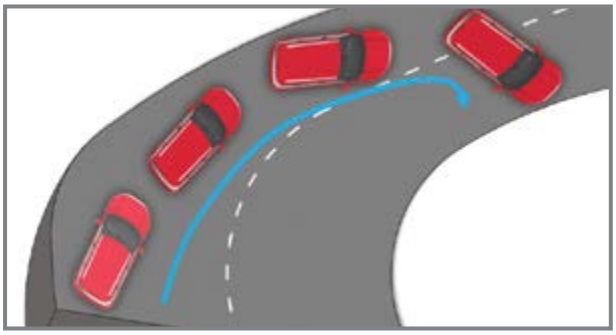


Figure 8.19 Skidding caused by overspeeding on curves

Skids are dangerous at all times, but certain conditions can make them even worse. For example:

- poor car maintenance, such as bald tyre and low tyre pressure
- road conditions – water, oil or sand on the road can make it slippery

The **ABC** of avoiding skids are:

√ Accelerate gently,
√ Brake gently,
√ Corner gently.

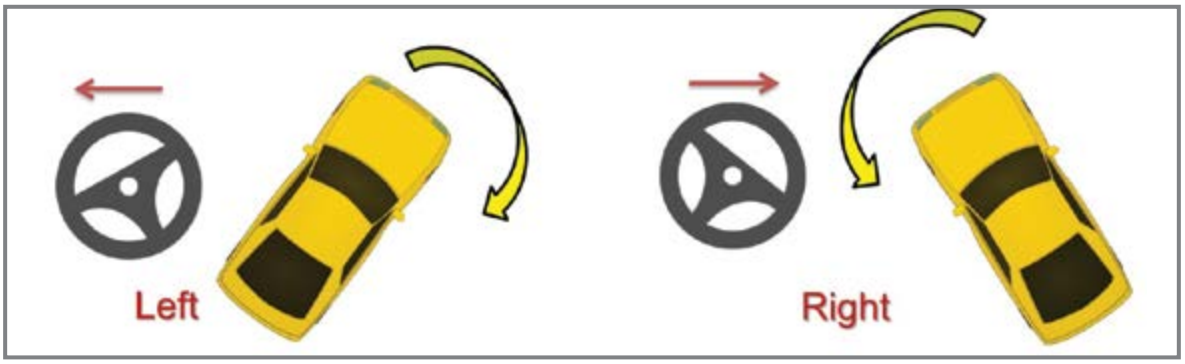


Figure 8.20 Steps to avoid skidding of cars

If your car begins to skid, follow these steps:

a) Turn the steering wheel in the direction your vehicle is skidding (Figure 8.20). If the rear of your car is skidding to the left, steer to the left. If the rear of your car is skidding to the right, steer to the right. When you steer to correct a skid, another skid may result in the opposite direction. But the second skid will not be as severe as the first. Be prepared to stop the second skid by steering in the opposite direction. It may take several steering movements to regain control of your car.

b) If the car skids, do not use your brakes. If you hit the brakes, the skid will be worse. By braking, you also risk locking your wheels and losing control of steering altogether.

8.7 Exercise Questions

1. **What is the first thing that is to be done when there is a car fire emergency?**
   a) Turn off the ignition
   b) Stop the car in the middle of the road
   c) Stop the car at the side of the road
   d) Use water to stop the fire

2. **When the rear of your car is skidding to the left, you should _____**
   a) Steer to the right
   b) Slam the brakes
   c) Steer to the left
   d) Use hand brakes

3. **How far should you keep the hazard triangle from the vehicle in case of a breakdown?**
   a) 40 metres
   b) 30 metres
   c) 15 metres
   d) 50 metres

4. **Which of these is a more effective braking technique when your car is skidding?**
   a) Slamming on the brakes hard
   b) Using hand brakes
   c) Pumping the brakes hard
   d) Do not brake

5. **During an accident, when being hit from the rear by another car, what should be the position of your head?**
   a) Bend down to the steering
   b) Maintain no gap between the headrest and the head
   c) Sideward to the windscreen
   d) Perpendicular to the windscreen

CHAPTER 9

First Aid

Nirmal Kumar Som

9.1 Introduction

During our journey, we may come across road traffic accidents. Being a responsible citizen, we always try to help in these situations. In view of that, we must know the basics of first aid because it is a matter of life and death. First aid is the initial care provided to a suddenly sick or injured person before arrival of the ambulance services or a doctor. Aims of First Aid are to:

- Preserve life
- Prevent the condition worsening
- Promote recovery

9.2 First Aid Kit

A First Aid Kit (Figure 9.1) contains supplies which you might need during an emergency. These are usually kept in a sturdy, waterproof container that is clearly labelled. The container is usually kept in the front box in small vehicles and behind the driver seat in large vehicles so that it can easily be accessible in case of an emergency. You should always check it at the beginning of each work period and replace what you used. Most of the first aid kits contain the following materials:

- Alcohol swab
- Gauze pads
- Antibiotic ointment
- Compress dressing
- Adhesive tape
- Adhesive bandage
- Roller bandage
- Triangular bandage
- Scissors
- Gloves
- Piece of rope

Figure 9.1 Contents of a first aid kit

9.3 Act on Scene

As a First Aid provider, you should be aware and responsible, and should not panic. You should also seek the help of others, when available. You should call for the ambulance by dialing 102 or inform the responsible authority. Assess the scene to decide whether you are safe to provide first aid. The first aider, the most important person in that scene, should not injure oneself while attempting to provide first aid.

If casualty occurs in the midway, first have control over the traffic. When you come across an accident, make sure that the ignition is turned off, and the hand break is on. Remove and take the victim(s) to a safer area, especially from the vehicle

with leaking fuels. Have a quick but thorough check of the victim from head-to-toe to assess the nature of injuries and then take appropriate first aid measures in order of priority. Send the casualty to the hospital or to his home with somebody responsible. Give them all the relevant information they may need.

9.4 Wound

A wound is a break in the skin following injuries. Different types of wounds may occur to an accident victim, and you should be able to recognise the type of wound before providing first aid. The types of wounds are as follows:

- Abrasion - Bruise, bleeding under the skin.
- Laceration - a jagged cut caused by a hard object.
- Incised - a sharp long cut by sharp metal or glass.
- Puncture - deep wound caused by a nail.
- Avulsion - deep wound including skin and muscle.
- Amputation - part of body e.g. Finger or hand totally detached.

The type of bleeding from a wound can help us to find the source:

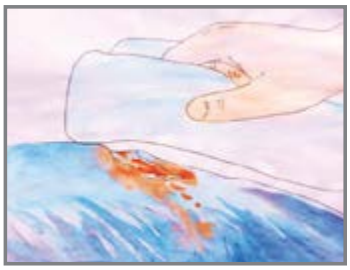
- Arterial bleeding is usually spurting.
- Venous bleeding is steady flow.
- Capillary bleeding causes oozing of blood.

There also may be internal bleeding following an accident which rapidly progresses to shock, and you should be aware of such a situation. In order to prevent/manage bleeding follow the guidelines mentioned below (Figure 9.2).

- Raise and support the injured limb.
- Cover the wound with sterile gauze.
- Apply direct pressure to control bleeding.

Raise and support limb

Cover with sterile gauze



Apply direct pressure

Figure 9.2 Management of bleeding

9.5 Pressure Points

A pressure point is a place where pressure can be applied to stop the flow of blood to the limb. This can be used when direct pressure cannot control the bleeding. Here, the artery can be pressed over bony area to stop blood flow beyond that area. For upper limb, pressure point is over arm near the armpit, and for lower limb, it is over the upper part of the thigh near the hip joint (Figure 9.3).

Figure 9.3 Pressure points in a human body

9.5.1 Tourniquet

Tourniquet is applying pressure by binding with rope or piece of cloth proximal to the wound. It is the last resort to control bleeding. Once a tourniquet is applied, it should not be removed by anyone other than a doctor. The different steps you need to follow while making a tourniquet is shown in Figure 9.4

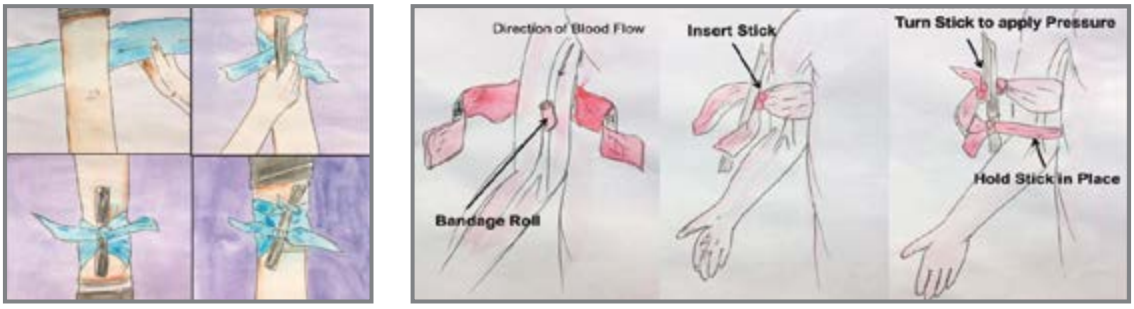


Figure 9.4 Steps of making a tourniquet

9.6 Fracture

Fracture is a crack or break in the bone. The different types of fracture are:

- Closed - bone is broken, but the skin is intact.
- Open - bone is broken, and skin is also broken.
- Complicated - broken bone damaged the underlying organ i.e. brain, liver and spleen.

9.6.1 Signs & Symptoms

There is generally a pain, swelling and loss of movement. There may be irregularity and crackling over the fracture site.

9.6.2 Treatment

Steady the injured area and provide some support to reduce pain. You can immobilise the limb with a splint. In the case of open fracture, cover the wound with sterile gauze. In a closed wound, cold compression can be applied. Most of the fractures are associated with bleeding. So don't try to push the fragment back to place unless you are well-trained, as this may lead to more complications. The most important action in any suspected fracture is the immobilisation of limb with the help of a splint.

9.7 Soft Tissue Injury

Soft tissue injuries can be of two types:

- Sprain - torn ligament in a joint.
- Strain - torn or overstretched muscle.

9.7.1 Treatment

Rest the injured area on a level surface, provide ice compression and elevate the limb.

9.8 Burns

Three types of burns may happen to the injured victim. These are as follows:

- Superficial - skin is red and is sore.
- Partial thickness - skin is red with blisters and is painful.
- Full thickness - black waxy colour, nerves have been burned.

9.8.1 Treatment

Remove constricted clothing from victim's body. Water application for ten-fifteen minutes is necessary. This should be followed by dry sterile dressing, and then treatment of shock, if any. In the case of severe burns to the accident victim, you should keep the following in mind.

a) Do not remove anything that is sticking to the burns.

b) Do not apply lotion or ointment over the burns.

c) Do not break blisters over injured/affected area.

d) Do not overcool the victim causing shivering.

e) If breathing and pulsation stops, instantly start resuscitation with Cardio Pulmonary Resuscitation (CPR).

9.9 Treatment of Shock

After an injury, the accident victim may enter into a shock. In that case, you must take quick action through the following steps:

a) **SHAKE & SHOUT:** You can do this by gently shaking their shoulders and by saying "Hello, can you hear me?" If the person does not answer, it means that the person is unconscious.

b) **CALL FOR HELP:** You must then call for help. If there is a bystander, ask him to call an ambulance and assist you. If there is no one, you must call for an ambulance by dialling 102 as any unconscious casualty needs to go to the hospital.

c) **Cardio Pulmonary Resuscitation (CPR):** CPR is the skill necessary to artificially provide circulation of blood to the brain and air to the lung in order to prevent damage to the brain. It is only performed on someone who is unconscious, not breathing, no pulse or sign of circulation. It is done until any medical help arrives.

9.9.1 Steps of Providing CPR

As shown in Figure 9.5, the three primary steps of CPR is Circulation, Airway and Breathing (CAB). In general, you should follow the following steps (Figure 9.6) while providing CPR to the accident victim.

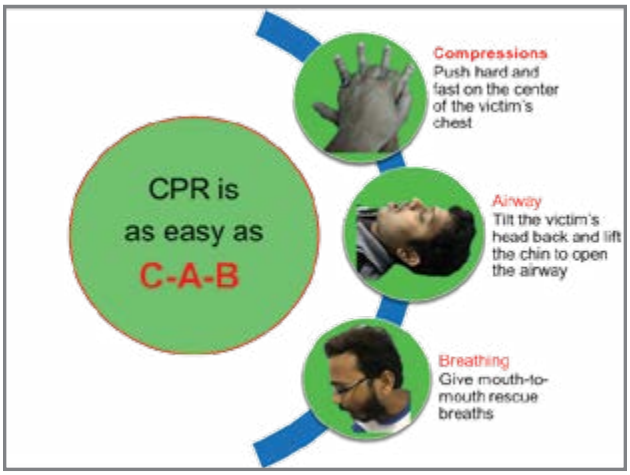


Figure 9.5 The C-A-B process of CPR

Step 1: The victim should be laid down flat on a hard surface.

Step 2: You (the rescuer) should kneel beside the victim's chest.

Step 3: Clean the victim's mouth and remove any foreign body or artificial denture.

Step 4: Place the heel of the hand on the centre of lower part of the sternum (breastbone). Put the heel of another hand on the top of the first hand.

Step 5: Keep arm straight, elbow locked and interlock fingers to avoid compression on the ribs. Now push down at least 2 inches at a rate of at least 100 times per minute.

Step 6: After each compression, let the chest come back to its normal position.

Step 7: After every 30 compressions, give 2 slow rescue breaths. If more than one rescuer is present, after every 15 compressions, give 2 slow rescue breaths. Each given breath should be slightly over 1 second and give sufficient air to ensure visible chest rise.

Step 8: After five cycles of compressions, check for signs of circulation. If it is still absent, then continue another five cycles. Perform five cycles (approx. 2 minutes) of compression and ventilation (ratio 30:2). Switch the compressor at every 2 minute interval.

Step 9: Before you start ventilation, open airway using a head tilt/chin lift manoeuvre (be careful in a patient with suspected neck injuries).

Step 10: If the victim is breathing and circulation is present, keep the victim in recovery position and treat any life threatening injuries.

Step 11: If the victim is still unconscious, not breathing and no pulse, continue the CPR till the victim is examined by a doctor or is taken to the hospital.

Step 4 Step 5 Step 7 Step 8

Figure 9.6 Different steps of CPR

9.10 Concluding Remarks

Knowledge of first aid should spread among more and more people so that appropriate measures can be taken in time to prevent any damage and loss of life.

9.11 Exercise Questions

1. **How will you identify a capillary bleeding?**
   a) The wound causes a steady flow of blood
   b) The wound causes oozing of blood
   c) The wound causes spurting of blood
   d) None of the Above
2. **What should primarily be done when you identify a fracture?**
   a) Immobilise the fractured limb with the help of a splint
   b) Push the fractured bone back in place
   c) Apply cold compression irrespective of type of wound
   d) All of the Above
3. **What should you not do in case of a severe burn to the accident victim?**
   a) Apply lotion or ointment over the burns
   b) Remove anything that is sticking to the burns
   c) Try to cool down the victim as quickly as possible
   d) All of the Above
4. **What are the three primary steps of CPR?**
   a) Airway, Breathing and Compression
   b) Breathing, Compression and Airway
   c) Compression, Airway and Breathing
   d) Airway, Compression and Breathing
5. **What should you take care of before providing ventilation?**
   a) Open airway using a head tilt/chin lift manoeuvre
   b) Clean the victim's mouth and remove any foreign particle inside
   c) Lay down the victim on a hard and flat surface
   d) All of the Above

CHAPTER

10

Legal Aspects of Driving

Uday Shankar

10.1 Introduction

Drivers play a vital role in making the use of road safe and secure. In order to drive a motorized vehicle on the road, the drivers need to obtain a valid and effective licence from the competent authority prescribed under the Motor Vehicles Act, 1988. Presumably, the issuing authority verifies the necessary credentials of the applicant before granting him/her the driving licence. The driver is required to exhibit the learning while driving the vehicle. Any casualties due to irresponsible driving may attract penal provisions enumerated under the Motor Vehicle Act, 1988 and the Indian Penal Code, 1860. Any plea with regard to ignorance of law will not bring any benefit to the wrongdoer on account of a well-known legal principle that 'ignorance of law excuses know one'.Therefore, want of information about the legal provisions related to offences regarding driving would not confer any benefit on the driver. It is incumbent upon the driver to get acquainted with various provisions which deal with offences related to driving motor vehicles. The drivers are required to know that any breach of the directions/guidelines/instructions would invite penalty as prescribed under the Motor Vehicles Act, 1988. In addition to the penal liability arising under the Motor Vehicles Act, 1988, the penal law of the country may also get attracted for certain act or omission of the driverers which would bring in harsher penalties. Therefore, as a driver, he/she should be aware of the offences related to motor vehicles given under the Motor Vehicles Act,1988 as well as the Indian Penal Code,1860. This chapter highlights the different provisions on offences related to driving of motor vehicles.

10.2 Applicability of Indian Penal Code (IPC)

Indian Penal Code, 1860 is the main criminal code of India which details out substantive aspect of offences and punishment thereof. The Code prescribes certain act or omission. Certain conduct of a driver could attract criminal liability under the Indian Penal Code. The driver should be aware of the fact that the attraction of penal law would bring legal complexities and trouble from the law-enforcement agencies. The procedural requirement under the penal law may be rigorous in comparison to the Motor Vehicles Act, thus might bring more discomfort to the wrongdoer. They are described hereinunder.

If a driver drives a vehicle or rides on a public way in a rash or negligent manner as to endanger human life or to be likely to cause hurt or injury to any other person, then he/she shall be punished with imprisonment of either description for a term which may extend to six months or with fine which may extend to one thousand rupees or with both. Even if the act is not deliberate on the part of the driver, the criminality will get attracted on account of over-hasty act on his/her part. In order to attract the penal provision, there is no

need to establish that the rash or negligent act has resulted into injury to life or property. In case of any injury or death due to rash or negligent driving, the consequences of death or injury would be dealt under necessary penal provisions. Place, time, traffic and crowd are important factors to determine rashness or negligence.

In case rash or negligent driving results into death, the driver shall be punished with imprisonment of either description for a term which may extend to two years, or with fine or with both. The penal provision will get attracted when death is caused due to rash or negligent driving. The one who is driving the vehicle needs to be careful not only about the haste-act on his/her part but also sincere observation of the duty entrusted upon him/her as a driver. All the reasonable or foreseeable duty of a driver would be brought within the ambit of this section. For example, a driver who was driving an overloaded lorry and was signalled by a police officer to stop, but he refused to do so and drove on at an excessive speed wishing to escape the chase of the police officer. During the chase a girl tried to cross the road and was knocked down and killed, it is a case of rash or negligent driving causing death.

It is important to know that there is a solemn duty to be truthful about the information to be sought by the public servant, in the present case read as police officer, and legally bounden duty to produce a valid document asked for. In case the police officer asks for a driving licence or document related with motor vehicle, the driver intentionally omits to produce the documents will be punished with simple imprisonment for a term which may extend to one month, or with fine which may extend to five hundred rupees or with both. If the information given turns to be false then he/she shall be punished with simple imprisonment for term which may extend to six months or with fine or both. Therefore, the driver should cooperate and display honesty in dealing with a police officer.

The driver/owner of a vehicle should avoid preparation/carrying of any forged document related to the vehicle or license. Any commission of forgery shall be punished with imprisonment of either description for a term which may extend to two years, or with fine, or both. The offence of forgery is also committed by making, signing or sealing or executing a document with the intention of causing it to be believed that such document was a valid one.

Any conviction under penal law may disqualify the holder of the driving license from holding the valid license under the Motor Vehicles Act. The cancellation or suspension of the driving license or a declaration that the accused offender is disqualified for obtaining license either permanently or for a certain period will have a very deterrent effect, especially in the case of persons who earn their livelihood by driving motor vehicles.

10.3 Offences under Motor Vehicles Act, 1988

The Motor Vehicles Act, 1988 along with rules regulate the registration of vehicles, issuance of permits to the owners of the vehicles and issue of license to the drivers. Unauthorised use of a vehicle or breach of rules or regulation by the driver constitutes offences under the Motor Vehicles Act, 1988. Any injury or death of individual due to erred driving warrants payment of compensation to the injured or legal heirs of the deceased. Apart from the liability to pay compensation, several acts of the driver may constitute offence under the Motor Vehicles Act, 1988.

Under the Act, offences are of two types, compoundable and arrestable. Compoundable offences allow the wrongdoer to admit the guilt and get discharged after payment of fine prescribed under the Act/Rules. Such an offer to the offender who is found on the spot to have committed any of the offences listed in the Act, can be accepted by the police officer or any other authority designated by the State Government. Section 200 of the Act gives an option to the offender, if he so chooses, to get the offences compounded. Some of the offences included under this section are: General provision for punishment of offences; disobedience of orders, obstruction and refusal of information; allowing unauthorised persons to drive vehicles; driving vehicles without valid and effective driving licence; offences relating to licence; driving at excessive speed; driving dangerously; driving when mentally or physically unfit to drive; racing and trials of speed; violation of standards prescribed in relation to road safety, control of noise and air pollution; using of vehicle without registration; driving vehicle exceeding permissible weight; driving uninsured vehicle; and unauthorised interference of vehicle.

Arrestable offences empower the police officer to arrest the wrongdoer without warrant. If the driver refuses to give his name and address, then he may be arrested without warrant. For justifying the arrest, it is necessary to establish that the driver is required under the law to give his name and address but he refused. Police officer may arrest without warrant in case of dangerous driving, drunken driving and taking vehicle without authority.

For the purpose of the chapter, the offences are categorised under different headings.

10.3.1 Disobedience of Order of Authorities

The lawful instruction or order given by any person empowered under the Act shall be honoured by the driver of the vehicle. The driver should not disobey the direction/order or obstruct the person or authority. Any violation shall attract, if no other penalty is provided for the offence, the punishment with fine which may extend to five hundred rupees. Under the proposed Amendment Bill, the penalty is increased to INR 2000.

10.3.2 Allowing Unauthorised Persons to Drive Vehicles

Owner of the vehicle or a person in charge of a motor vehicle allows/permits any other person who does not have a valid licence to drive the vehicle shall be punished with imprisonment for a term which may extend to three months, or with fine or both. It is essential to establish that the owner or person in charge had the necessary intention to allow the use of vehicle by others. Under the proposed Amendment Bill, 2016, the minimum penalty suggested is INR 5000.

10.3.3 Driving without Valid and Effective Licence

Anyone who does not have a valid or effective licence or below the age of 18 years drives a vehicle would attract the punishment with imprisonment for a term, which may extend to three months, or with fine, which may extend to five hundred rupees, or with both. A driver who used a fake driving licence is liable to punishment. In case of expiry of the licence, if the driver drives the vehicle without renewing the same then he/she shall be punished. Under the proposed Amendment Bill, 2016, the minimum penalty suggested is INR 5000.

Anyone who is disqualified to hold or obtain a driving licence drives a motor vehicle in a public place shall be punishable with the imprisonment for a term which may extend to three months or with fine which may extend to five hundred rupees or both. The punishment shall also be attracted in the case of obtaining licence without disclosing the endorsement made on a driving licence. Under the proposed Amendment Bill, driving despite disqualification would attract minimum penalty of INR 10,000.

10.3.4 Overspeeding

Driving a motor vehicle in contravention of the speed limits prescribed, is punishable with fine which may extend to four hundred rupees, or, if having been previously convicted of an offence under this sub-section with fine which may extend to one thousand rupees. Under the proposed Amendment Bill 2016, the minimum penalty is INR 1000 for LMV and INR 2000 for Medium Passenger Vehicle.

However, no person shall be convicted of the above offence solely on the evidence of one witness to the effect that in the opinion of the witness such person was driving at a speed, which was unlawful, unless that opinion is shown to be based on an estimate obtained by the use of some mechanical device. Whether the speed is excessive or not must depend upon a number of circumstances such as condition of road, the nature of locality, the time, etc.

10.3.5 Driving Dangerously

Rash driving of a motor vehicle gives rise to penalties on the criminal side also. A mere formal statement of a police officer that the accused was driving the vehicle along a public road at a high speed or in a dangerous manner and that there were some people going on the road at the time is not sufficient for a conviction. There should be independent evidence showing the nature, the condition and use of the place where the vehicle was driven and the amount of traffic which actually was at that time or which might reasonably be expected at that place. Talking on a mobile phone, while driving, may support a case of dangerous driving.

Dangerous driving shall be punishable for the first offence with imprisonment for a term which may extend to six months or with fine which may extend to one thousand rupees, and for any second or subsequent offence if committed within three years of the commission of a previous similar offence with imprisonment for a term which may extend to two years, or with fine which may extend to two thousand rupees, or with both. Under the proposed Amendment Bill 2016, the penalty may be imposed up to INR 5000.

10.3.6 Drunken Driving

Driver sitting on the wheels need to be in complete consciousness and alert. The law imposes duty on the driver to not to drive the vehicle in drunken condition or under the influence of drugs. Anyone violating the obligation shall be punished with imprisonment which may extend to six months, or with fine which may extend to two thousand rupees or with both. In case of breach of the rule for the second time or subsequently, the punishment shall be imprisonment extended upto two years or with fine which may extend to three thousand rupees. Whether the driver is in drunken state or not is being detected in a test by breath analyser or laboratory test or chemical test, therefore the onus lies on the one who alleges the same. Driving in intoxicated condition has been considered as major cause for the accident and reason for fatalities amongst the users of the road. Perhaps, in order to deter the driver to not to drive in drunken state, the proposed Amendment Bill 2016 provides for minimum penalty of INR 10,000.

10.3.7 Racing

Adventurous conduct of the driver may prove to be highly dangerous for other users of the road, hence speeding is considered as a prohibited act under the law. Speeding or racing shall be punishable with imprisonment for a term which may extend to one month or with fine which may extend to five hundred rupees or with both. The proposed Amendment Bill, 2016 also considers it as a menace and proposes minimum penalty of INR 5,000.

10.3.8 Assistance in case of Accident

When a person is injured or any property of third party is damaged as a result of accident, in which the motor vehicle is involved, the driver of the vehicle shall take all reasonable steps to secure medical attention of the injured person, and if necessary, to move him to the nearest hospital, unless the injured person or his guardian, desires otherwise. In case of violation of the rule, the driver shall be punishable with imprisonment for a term which may extend to three months, or with fine which may extend to five hundred rupees or with both.

Timely assistance to the victim(s) of a road accident is considered as a major factor to reduce the loss of life and to minimise the casualties. Formerly, at the spot of the accident, the bystanders and passers-by avoid to lend any helping hand due to fear of the police or hassles of the court proceedings. On a petition filed by an NGO "Save Life Foundation", the Supreme Court of India has given detailed guidelines, in the year 2016, to provide a legal shield from any kind of harassment to the people who helps the victims of road accidents. The Court has approved the standard operating procedures for the examination of "Good Samaritans". The standard procedure states that the good Samaritans are to be treated respectfully and without any discrimination, the informant of the road accident need not disclose his/her name, address, phone number etc. to the police, the police, on arrival at the scene, cannot compel the informant to disclose the identity or address or to be witness. If a good Samaritan so chooses to be witness, then he/she shall be examined with utmost care and respect and without any discrimination. The examination shall be conducted at a time and place of the convenience of the good Samaritan and the police officer shall visit him/her in plain clothes. If examination is not possible at a time and place of his/her choice and asked to visit the police station, then the reason for the same should be recorded in writing. In case of examination at the police station, he/she shall be examined in a single examination in a reasonable and time bound manner, without any undue delay. He/she shall also be allowed to give his evidence on affidavit as per the law. The Court has also stated that "The Superintendent of Police or Deputy Commissioner of Police or any other Police official of corresponding seniority heading the Police force of a District, as the case may be, shall be responsible to ensure that all the above mentioned procedures are implemented throughout their respective jurisdictions with immediate effect." This pronouncement was made to have an impact in reducing the causalities of road accidents. There is a need to publicise the guidelines and enforcement of guidelines by concerned authorities.

10.3.9 Using Vehicle in Unsafe Condition

The law imposes a responsibility upon the driver to maintain and keep the vehicle in proper condition. The driver needs to exercise ordinary care to ensure that the driving of vehicle should not be a source of danger to persons or vehicles using public place. The non-observance of the rule shall be punishable with fine which may extend to two hundred and fifty rupees. If as a result of such defect an accident is caused causing bodily injury or damage to property, such person shall be punishable with imprisonment for a term, which may extend to three months, or with fine, which may extend to one thousand rupees, or with both.

The law also enjoins the duty on the driver to maintain the standards prescribed in relation to road safety, control of noise and air-pollution. Violation of the standard shall be punishable for the first offence with a fine of one thousand rupees and for any second or subsequent offence with a fine of two thousand rupees. The proposed Amendment Bill, 2016 enhances the penalty upto INR 5000.

10.3.10 Seatbelt and Helmet

Use of safety measures is very significant for safe driving. It is generally expected from a driver to take all necessary caution to make driving safer. One such measure of safe driving is the use of seat belt. Generally, it has been observed that the driver does not take the use of seat belt very seriously while driving. Considering this the Amendment Bill, 2016 enhances the penalty from INR 100 to INR 1000. Similarly the use of helmet is considered as a luxury and not mandatory by the driver of a two-wheeler. The proposed Amendement Bill enhances the penalty upto INR 1000.

10.3.11 Using Vehicles without Registration

The driver is under an obligation to drive the vehicle only after obtaining necessary documents issued by the competent authority. Driving of unregistered vehicle shall be punishable for the first offence with a fine which may extend to five thousand rupees but shall not be less than two thousand rupees for a second or subsequent offence with imprisonment which may extend to one year or with fine which may extend to ten thousand rupees but shall not be less than five thousand rupees or with both. In the prposed Bill, the law makers have introduced punishment of imprisionment, for a term which may extend to one year, along with fine and enhanced fine i.e., INR 10,000.

10.3.12 Impounding of Documents

Police officer or authorities may impound document in a case that the document is a false document. The impounding authority need to clearly state that what provisions are violated by the driver and state the reasons for such impoundment. In case the driver admits the guilt, he may decide to close the case by paying fine indicated in the summons. The idea underlying is to protect the persons involved in minor offences, so that they may not be harassed by a long process of trial by appearing in court. Under the proposed Amendment Bill, 2016, the impounding officer may recommend for disqualification or revocation of licence to the licencing authority.

10.3.13 Residual Penal Provision

In the absence of a specific penal provision in the Act, contravention of any provision, except specific section indicates the penalty for the contravention, will be punishable under the law. It makes a person liable under the provision if no other penalty is provided for the offence. It is clear that the driver need to know the relevant law or rule in order to avoid penalty or imprisonment for breach. Hence, the responsibility lies on the trainer to educate the learner about the provisions of the law in a very meticulous way and without compromise.

10.4 Final Notes

The main purpose of this chapter was not to inform you about the amount of fine you need to pay for a breach of rule but to make you aware that such breaches are legal offences and you should, by all means, abstain from such unsafe acts while driving on the road. Notably, breaches of some of the rules attract penal provisions prescribed under the Indian Penal Code which may create legal complications for the drivers by implicating them into a cobweb of criminal litigation. Therefore, a comprehensive education related with usage of motor vehicles offered in this manual is expected make the road safer for everyone.

10.5 Exercise Questions

1. **Identify the practice below which is not a legal offence.**
   a) Driving under influence of alcohol
   b) Racing with another driver
   c) Driving a faulty vehicle
   d) None of the above
2. **Identify the practice below which is a legal offence.**
   a) Driving a vehicle and not stopping after asked by a police officer to stop
   b) Driving a vehicle at high speed below specified speed limit
   c) Carrying inflammable object while driving
   d) All the above
3. **Identify the practice below which is not a legal offence.**
   a) Driving a motorcycle with helmet for both driver and pillion rider
   b) Driving a motorcycle without helmet
   c) Driving a motorcycle with helmet for driver but not for pillion rider
   d) Both (a) and (c)
4. **Suppose a situation where car owner has assigned a driver to travel to a particular destination with his own car. Identify the practice below in which the car owner is making a legal offence.**
   a) Both car owner and driver have valid driving license
   b) Only car owner has a valid driving license
   c) Neither have a valid driving license
   d) Both (b) and (c)
5. **A driver of a vehicle is involved in a road accident which has led to an injury of the accident victim. Identify the act below which is not a legal offence.**
   a) Driver not helping the accident victim to healthcare
   b) Driver not stopping the vehicle and fleeing from the situation
   c) Driver bringing the accident victim to the nearest hospital
   d) None of the above

References

Baldwin, Z. (n.d.). How to Safely Drive In Fog. Retrieved January 09, 2017, from https://www.defensivedriving.com/safe-driver-resources/how-to-safely-drive-in-fog/

Central Motor Vehicles Rules, 1989, Government of India.

D. C., & Writer, G. (2016). 10 tips for driving safely in fog in the UAE. Retrieved January 09, 2017, from http://gulfnews.com/guides/life/community/10-tips-for-driving-safely-in-fog-in-the-uae-1.1418864

Department of Planning, Transport and Infrastructure, Government of South Australia. (2016). The driver's handbook. Retrieved January 9, 2017, from http://mylicence.sa.gov.au/__data/assets/pdf_file/0009/152874/MR200_p1-40.pdf

Distracted Driving: An Epidemic "A Study of Distracted Driving Attitudes, Behaviors and Barriers Preventing Change" - Angela Durant, Kelsie Lawson, Simon Schubnell, and Kristina Wolf; MBA 519: Graduate Research , School of Business, Southern Oregon University

Doheny, K. (2015). Tips for Driving Safely in the Rain. Retrieved January 09, 2017, from https://www.edmunds.com/car-safety/tips-and-techniques-for-driving-in-rain.html

Driving Analogy for Ethics [http://www.ethicsdefined.org/diving-into-the-gray/driving-analogy-for-ethics]

Driving Test Tips. (n.d.). Hill Starts. Retrieved January 09, 2017, from http://www.drivingtesttips.biz/hill-starts.html

Driving Tests Tips – Anticipation and Planning [http://www.drivingtesttips.biz/anticipation-and-planning.html]

Federal Highway Administration. (2014). Work Zone Safety for Drivers. Retrieved January 09, 2017, from http://safety.fhwa.dot.gov/wz/resources/fhwasa03012/

Govt. of New South Wales, Transport, Road and Maritime services. Retrieved September 14, 2016, from http://www.rms.nsw.gov.au/documents/roads/licence/road_users_handbook-english.pdf

Govt. of West Australia, Department of Transport. Retrieved September 16, 2016, from https://www.transport.wa.gov.au/mediaFiles/licensing/LBU_DL_B_DriveSafeFull_c.pdf

GST- mylicence.sa.gov.au. Retrieved September 15, 2016, from http://mylicence.sa.gov.au/__data/assets/pdf_file/0009/152874/MR200_p1-40.pdf

Indian Driving School [www.indiandrivingschool.com]

Indian Road Congress: SP: 55-2014. "Guidelines on Traffic Management in Work Zones", New Delhi, India

Institute for Road Safety Research. (2012). "SWOV Fact Sheet: Vulnerable Road Users," p.3–4

IRC: 35-2015 "Code of Practice for Road Markings". Indian Roads Congress. New Delhi, India

IRC: 67-2012 “Code of Practice for Road Signs”. Indian Roads Congress. New Delhi, India

IRC: SP-44-1996. “Highway Safety Code”. Indian Roads Congress, Government of India, New Delhi.

Law Commision of India. (1860). “Indian Penal Code”. Ministry of Law, Government of India.

Law Commision of India. (1988). “Motor Vehicles Act”. Ministry of Law, Government of India.

Ministry of Road Transport & Highways Transport Research Wing. Road Accidents in India - 2015. New Delhi; 2016:103. Available at: http://www.morth.nic.in/showfile.asp?lid=2143. Accessed January 7, 2017.

Missouri Department of Transportation. (n.d.). Work Zone Driving Tips. Retrieved January 09, 2017, from http://www.modot.org/workzones/safety/

National Highway Traffic Safety Administration. (2010). Overview of the National Highway Traffic Safety Administration’s Driver Distraction Program. DOT HS 811 299. Washington, DC: National Highway Traffic Safety Administration, Washington.

New South Wales Repealed Regulations. (n.d.). Australian Road Rules - Reg 221 Using hazard warning lights. Retrieved January 09, 2017, from http://www.austlii.edu.au/au/legis/nsw/repealed_reg/arr210/s221.html

Parking. (n.d.). Retrieved September 02, 2016, from http://www.rms.nsw.gov.au/roads/safety-rules/road-rules/parking.html

Risks and road rage: Why driver safety is more than just skill - Spencer McDonald [http://www.cos-mag.com/Training/Training-Columns/risks-and-road-rage-why-driver-safety-is-more-than-just-skill.html]

S. (n.d.). SGI - Driver’s Handbook - Blind spots. Retrieved October 04, 2016, from https://www.sgi.sk.ca/individuals/licensing/studyguides/drivershandbook/roadrules/blindspots.html

Sarkar, P.K. (2004). “The Motor Vehicles Act, 1988”. Eastern Law House.

Save Life Foundation v. Union of India, MANU/SC/0354/2016

Stark, T. (2015). Help a Victim of a Car Accident. Retrieved September 05, 2016, from http://www.wikihow.com/Help-a-Victim-of-a-Car-Accident

Sudbury Student Services. Responsibilities of the School Bus Operator and the Drivers, June 10, 2002. Retrieved from http://www.businfo.ca/en/pdf/policies/responsibilities/M04%20202%20-%20Responsibility%20of%20the%20School%20Bus%20Operator%20and%20Driver.pdf

The New Zealand Transport Agency. (n.d.). Hill driving (manual). Retrieved January 09, 2017, from https://drive.govt.nz/learn-to-drive/hill-driving/hill-driving-manual/

The Official Bus Handbook. (n.d.). Retrieved September 14, 2016, from http://www.mto.gov.on.ca/english/handbook/bus/section2-2-0.shtml

The Power to Empower. Booklet on road safety, New Delhi: July 10, 2012. Retrieved from http://www.ficciflo.com/wp-content/uploads/2016/09/roadsafety.pdf

The Texas Department of Insurance, Division of Workers' Compensation.(n.d.). Driving in Highway Construction. Retrieved January 9, 2017, from http://www.tdi.texas.gov/pubs/videoresource/t5conezone.pdf

Traffic Warden Organisation: Tips on Good Driving. (n.d.). Retrieved September 09, 2016, from http://www.bcptwo.com/Tips_Good_Driving.html

U.S. Department of Transportation, Federal Highway Administration. (n.d.). Tips for safe driving in work zones. Retrieved January 9, 2017, from https://www.dot.ny.gov/programs/repository/10tipsrevise-speedkillsweb.pdf Updated: 2005¬11¬16 06:58

Wegman, F. & Aarts, L. (ed.) (2006).Advancing Sustainable Safety; National Road Safety Outlook for 2005-2020. SWOV, Leidschendam.

West Bengal Motor Vehicles Rules, 1989.

Y., C. (2011). Drivers Ed. Chapter 1 - Drivers Ed. with Dryer at Victor J Andrew High School. Retrieved September 14, 2016, from https://www.studyblue.com/notes/note/n/drivers-ed-chapter-1/deck/962420

Answer Key

Chapter 1: Know Your Road

1 (b) 2(b) 3(b) 4(d) 5(b) 6(d) 7(b) 8(c) 9(a) 10 (d)

Chapter 2: Road Signs

1 (b) 2(c) 3(b) 4(d) 5(d) 6(d) 7(b) 8(d) 9(b) 10 (c)
11 (d) 12 (c) 13 (c) 14 (a) 15 (d)

Chapter 3: Road Markings

1 (c) 2(b) 3(a) 4(c) 5(b) 6(b) 7(b) 8(b) 9(c) 10 (c)

Chapter 4: Rules for Safe Driving

1 (d) 2(d) 3(c) 4(b) 5(c) 6(a) 7(b) 8(a) 9(c) 10 (d)

11 (d) 12 (d) 13 (d) 14 (b) 15 (a)

Chapter 5: Driving in Complex and Sensitive Environment

1 (c) 2(a) 3(c) 4(d) 5(c) 6(d) 7(c) 8(d) 9(a) 10 (a)

11 (d)

Chapter 6: Vulnerable Road Users

1 (d) 2(c) 3(d) 4(c) 5(d) 6(c) 7(a) 8(a) 9(c) 10 (b)

Chapter 7: Alertness and Attitude

1 (d) 2(d) 3(a) 4(a) 5(d) 6(d) 7(b) 8(c) 9(a) 10 (d)

Chapter 8: Accidents and Emergencies

1 (a) 2(c) 3(b) 4(d) 5(b)

Chapter 9: First Aid

1 (b) 2(a) 3(d) 4(c) 5(d)

Chapter 10: Legal Aspects of Driving

1 (d) 2(a) 3(a) 4(d) 5(c)

Know the hand signals of traffic police and obey them

To stop vehicles coming from front

To stop vehicles coming from behind

To stop vehicles coming simultaneously from front and behind

To stop all vehicles

To change sign

To start vehicles coming from left

To start vehicles coming from right

সাবধানে চালাও
জীবন বাঁচাও