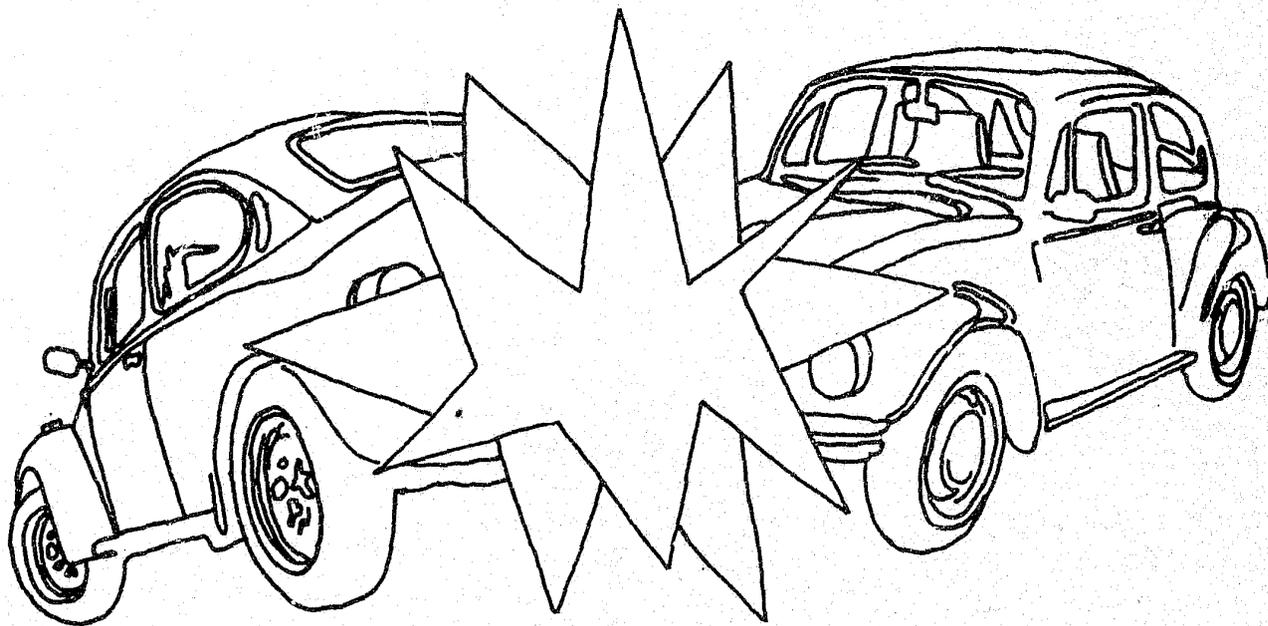


2

COLLISION MANAGEMENT BACKGROUND & INTRODUCTION



52073



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Baltimore City Police Academy - 9/29/75-11/21/75

Aberdeen Police Department
Baltimore County Sheriff's Office
Bowie State College
Brunswick Police Department
Cecil County Sheriff's Office
Coppin State College
Department of General Services
Harford County Sheriff's Office
Md. Center for Public Broadcasting
Mass Transit Administration
Military Department of Maryland
North East Police Department
University of Maryland-Baltimore County Campus

Salisbury, Maryland - 10/6/75-12/2/75

Cambridge Police Department
Centreville Police Department
Chestertown Police Department
Crisfield Police Department
Denton Police Department
Easton Police Department
Federalsburg Police Department
Fruitland Police Department
Hurlock Police Department
Kent County Sheriff's Office
Ocean City Police Department
Pocomoke City Police Department
Queen Anne's County Sheriff's Office
Queenstown Police Department
Rock Hall Police Department
Salisbury Police Department
Salisbury State College
Talbot County Sheriff's Office
University of Baltimore

Prince Georges County - 10/14/75-12/15/75

Armed Forces Police
Bladensburg Police Department
Brentwood Police Department
Calvert County Sheriff's Office
Charles County Sheriff's Office
Cheverly Police Department
GSA-Office of Buildings and Grounds
Hyattsville Police Department
Md. National Capital Park Police
Mt. Rainier Police Department
Riverdale Police Department
St. Mary's County Sheriff's Office
Takoma Park Police Department
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The opinions, findings and conclusions expressed in this publication are those of the authors and not necessarily those of the State of Maryland or the National Highway Traffic Safety Administration.

II

COLLISION MANAGEMENT BACKGROUND AND INTRODUCTION

ABSTRACT

This unit is designed to provide the student with an introduction and background information concerning collision management and the role of the Maryland law enforcement officer. It includes the primary accident management tasks which are carried out or supervised by the patrolman in Maryland, reporting procedures followed to record an accident, and Maryland procedures to investigate an accident. This unit also includes accident terminology, an explanation of various categories of motor accidents, and a complete anatomy of an accident. Finally, this unit deals with the causes of traffic accidents, the purposes of accident reporting, and the attributes of a good investigator. A glossary of definitions from the Maryland Automated Accident Reporting System has also been appended to the unit.

BEHAVIORAL OBJECTIVES

The objective of this lesson is to develop a fundamental understanding of concepts related to accident management field procedures, such as:

- Accident management functions
- Basic accident terminology
- Analytical terms to describe the major events of any traffic accident
- Causes of traffic accidents
- Purposes of traffic accident reporting and investigation
- Attributes of a good accident investigator
- Departmental organization of accident management activities.

II

COLLISION MANAGEMENT BACKGROUND

Introduction

"Accident management" is a designation for the police responsibilities concerned with the control and normalization of a traffic accident scene, the identification and documentation of the facts surrounding the accident, and the determination of contributing factors or related causes. The primary accident management tasks which are carried out or supervised by the patrolman are:

- Render first-aid as necessary to the victims of a traffic accident
- Establish safe passage for roadway traffic
- Gather and document facts surrounding the accident
- Determine the contributing factors of the accident
- Take any warranted law enforcement action
- Normalize the roadway environment affected by the traffic accident.

Note: For complete motor vehicle terminology, see Motor Vehicle Laws of Maryland, Article 66 1/2, Subtitle 1.

Accident Reporting

Accident reporting basically involves identifying and recording the relevant information about an accident on the "accident report form." Accident report forms are the convenient and standardized means for storing such accident-related information as:

- Who was involved
- What was involved, e.g., vehicle positions and pathways, extent of injury or damage, environmental conditions, conditions of vehicles and drivers
- Where the accident occurred
- When the accident occurred.

Much of the information for routine reports can usually be obtained from driver licenses and vehicle registration forms.

Accident Investigation

Accident investigation involves the use of thoroughly reported and accurate accident-related information to draw conclusions and form opinions about:

- How the accident happened
- Why the accident happened.

The information for accident investigation is more extensive than that required for routine accident reporting. The analysis of such detailed information as reports from drivers and witnesses, photographs, measurements, accident diagrams, and the physical conditions/evidence is usually necessary to:

- Reconstruct the accident and identify the operational factors that contributed to the accident--determine how this accident occurred.
- Identify the condition factors that contributed to the accident--determine why the accident occurred.
- Determine if law enforcement action is required. Law violations discovered as a result of an accident investigation are of three basic types:
 - Contributory traffic violation -- one which contributes to the accident such as excessive speed, failure to yield the right-of-way, following too closely, etc. This form of violation is often the operational factor that contributed to an accident, especially if the violation is a moving violation.

- Non-contributory traffic violation -- one which did not contribute to the accident, such as driving without a license or registration.
- Non-traffic violation -- a non-accident-related violation, such as the transportation of stolen merchandise, stolen cars, possession of drugs, etc.

Accident Terminology

The patrolman should have a grounding in basic "accident terminology," so that a standard level of discussion may be achieved in his accident reporting and investigation efforts. The definitions for the terms originate from the Maryland Automated Accident Reporting System, TR3-501. Some definitions have been appended to the end of this unit. Refer to the source for more detailed terminology.

Accident

This is "an unintended event that produces injury or damage. The word 'injury' includes 'fatal injury.'"

Motor Vehicle Accident

This is "an accident involving a motor vehicle in transport, but not involving aircraft or watercraft." More specifically, this term includes such situations as:

- Collisions with:
 - Another motor vehicle (in transport or parked)
 - Pedestrian
 - Other road vehicle
 - Animal
 - Object which is fixed, movable, or moving
 - Railway train

- A motor vehicle overturns without any preceeding collisions
- A motor vehicle sets something in motion which collides with something, without the motor vehicle doing the actual striking (e.g., parts of a vehicle, cargo, occupants, etc.)
- A motor vehicle is involved in a non-collision accident involving:
 - Poisoning by carbon monoxide from motor vehicle
 - Person falling, jumping, or being pushed
 - Fire in motor vehicle, explosion
 - Broken part of motor causing injury or danger, etc.
 - Broken glass caused by a propelled hard object (rock, metallic part).

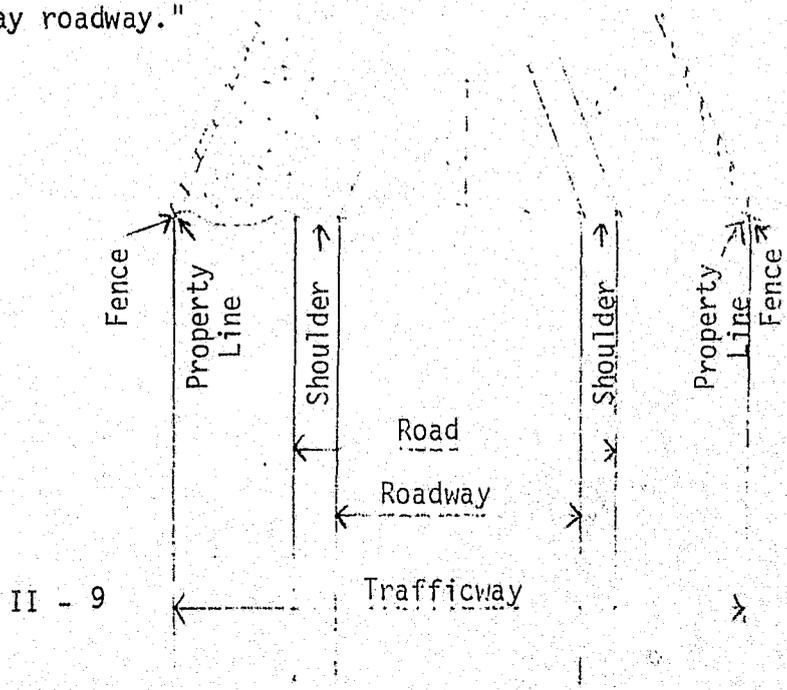
This term excludes injury or damage due to:

- Natural occurring events (e.g., flood, hurricane, tornado, lightning)
- Events occurring when the motor vehicle, not under its own power, is being loaded or unloaded from another conveyance
- Intentional damage or injury using motor vehicle
- Injury or damage intentionally inflicted by law enforcement agents.

Motor Vehicle Traffic Accident

This refers to "any motor vehicle accident that occurs on a trafficway or that occurs after the motor vehicle runs off roadway but before events are stabilized." Related to this concept are the following terms:

- Trafficway--"is the entire width between property lines, or other boundary lines, of every way or place, of which any part is open to the public for purposes of vehicular travel as a matter of right or customer."
- Road--"is that part of a trafficway which includes both the roadway and any shoulder alongside the roadway."
- Roadway--"is that part of a trafficway designed, improved, and ordinarily used for vehicular travel. In the event the trafficway includes two or more separate roadways, the term 'roadway' refers to any such roadway separately, but not to all such roadways collectively."
- Shoulder--"is that portion of the road contiguous with the roadway for accommodation of stopped vehicles, for emergency use, and for lateral support of the roadway structure. The line between the roadway and the shoulder may be a painted edge line, a change in surface color or material, or a curb. On some modern trafficways, there may be a surfaced shoulder on the right side, and frequently a narrower shoulder on the left side of a one-way roadway."



- Chain reaction accidents--"Sometimes, in the same area and within a short time, several motor vehicles may be involved in accidents during an adverse driving condition, such as reduced visibility due to fog. In such chain reaction accidents, it is frequently difficult to determine afterward whether this event was one accident without a moment in which the accident situation was stabilized, or whether several accidents occurred with the accident situation stabilized, between separate accidents. Consequently, for purposes of uniformity, consider such chain reaction accidents to be single motor vehicle accidents, unless a stabilized situation can be established between the several events that may occur in such chain reaction accidents."
- Deliberate intent--In cases when a motor vehicle is in transport and some person or persons intend that events should occur, such events are excluded from the classification of motor vehicle accidents. The two major examples of this exclusion are:
 - Suicide or self-inflicted injury
 - Homicide or purposely inflicted injury or damage.

Directions: Circle the letter of the one item which best completes the following statements.

1. Which of the following are primary accident management tasks to be carried out or supervised by the patrolman?
 - a. gather and document facts surrounding the accident
 - b. drive victims to the hospital
 - c. drive uninjured persons to their homes
 - d. all of the above.

2. Contributory traffic violations include:
 - a. failure to yield the right-of-way
 - b. driving without a license
 - c. both a and b
 - d. neither a or b.

3. Non-traffic violations include:
 - a. transportation of stolen merchandise
 - b. possession of drugs
 - c. both a and b
 - d. neither a or b.

4. An example of a non-collision accident is:
 - a. broken glass caused by propelled hard object
 - b. auto strikes a parked car
 - c. both a and b
 - d. neither a or b.

Turn to page II - 39 to check your answers.

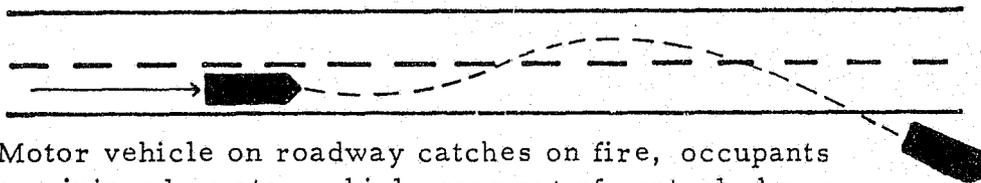
Major Types of Motor Vehicle Traffic Accidents

The following eleven categories of motor vehicle traffic accidents may occur on or off the roadway. Exhibits 2-1, 2-2, and 2-3 on the following pages illustrate some of these situations.

- Non-collision involving a motor vehicle in transport
 - Overturning
 - Other (e.g., CO poisoning; explosion; fire; falling, jumping, or being pushed from vehicle)
- Collision between motor vehicle in transport and:
 - Pedestrian
 - Motor vehicle in transport
 - Motor vehicle in other roadway
 - Parked motor vehicle
 - Railway train
 - Pedalcyclist
 - Animal
 - Fixed object
 - Other object (streetcar, animal carrying person, etc.).

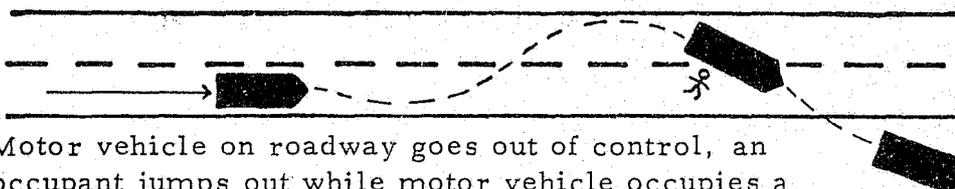
Exhibit 2-1
Non-collision events*

1. On Roadway - Other Noncollision



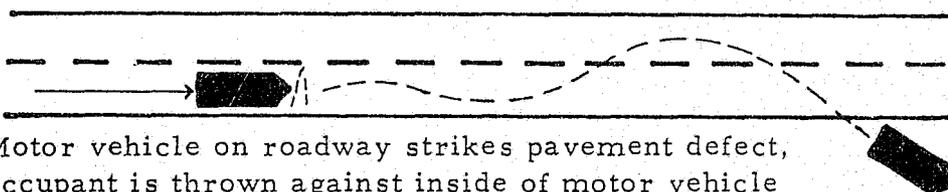
Motor vehicle on roadway catches on fire, occupants are injured, motor vehicle goes out of control, leaves the roadway, and overturns.

2. On Roadway - Other Noncollision



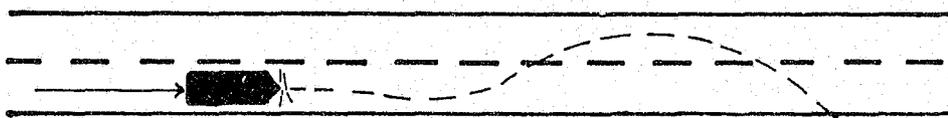
Motor vehicle on roadway goes out of control, an occupant jumps out while motor vehicle occupies a portion of the roadway, occupant is injured in the jump, motor vehicle leaves the roadway and overturns.

3. On Roadway - Other Noncollision



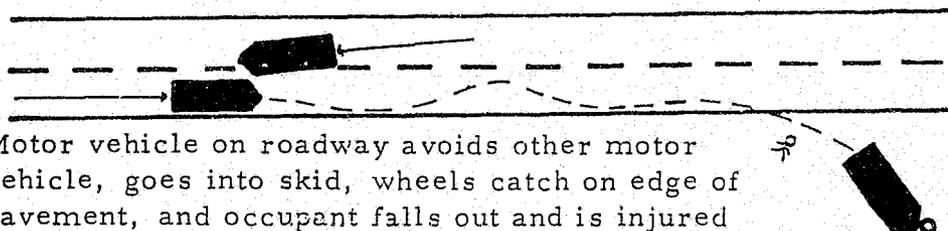
Motor vehicle on roadway strikes pavement defect, occupant is thrown against inside of motor vehicle and is injured, motor vehicle goes out of control, leaves roadway, and overturns.

4. Off Roadway - Overturning



Motor vehicle on roadway strikes pavement defect, there is no injury or damage, motor vehicle goes out of control, leaves roadway, and overturns, injuring occupants.

5. Off Roadway - Other Noncollision

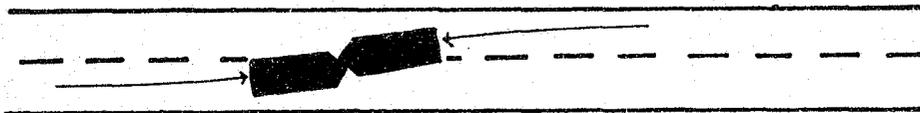


Motor vehicle on roadway avoids other motor vehicle, goes into skid, wheels catch on edge of pavement, and occupant falls out and is injured after the motor vehicle leaves the roadway, and the motor vehicle runs into a tree.

*Source: Figure 5, page 56. Manual on classification of motor vehicle traffic accidents © 1970, National Safety Council, Chicago, Illinois, used with special permission. See also the Maryland Automated Accident Reporting System.

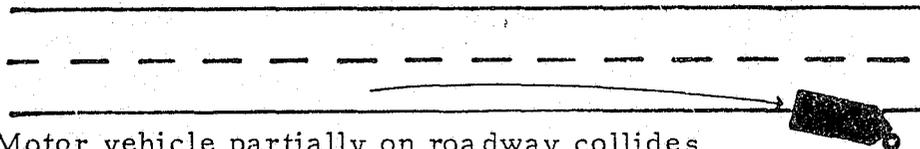
Exhibit 2-2
Single collision events*

1. On Roadway - Collision Involving Motor Vehicle



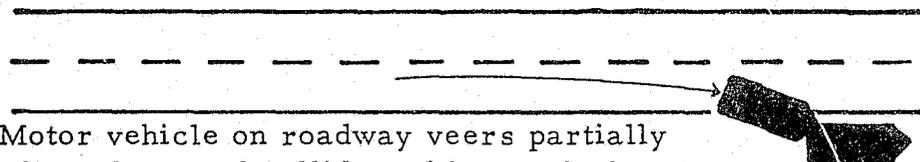
Motor vehicle on roadway collides with other motor vehicle on roadway, resulting in injury and damage.

2. Off Roadway - Collision Involving Fixed Object



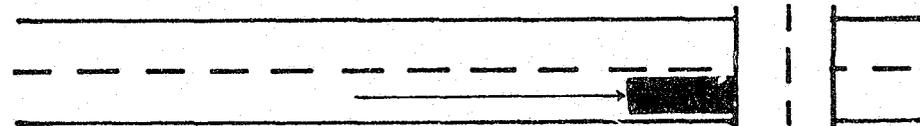
Motor vehicle partially on roadway collides with a tree off the roadway, damaging the motor vehicle and injuring occupants.

3. Off Roadway - Collision Involving Parked Motor Vehicle



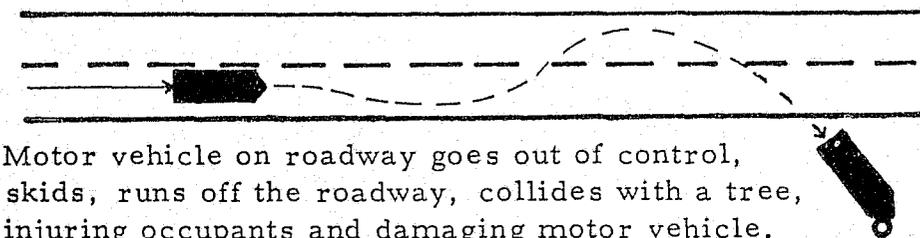
Motor vehicle on roadway veers partially off roadway and collides with a parked motor vehicle off roadway, injuring occupants and damaging motor vehicles.

4. On Roadway - Collision Involving Fixed Object



Motor vehicle (overheight truck) on roadway drives under an overpass and the top of the truck strikes the overpass, damaging the motor vehicle.

5. Off Roadway - Collision Involving Fixed Object

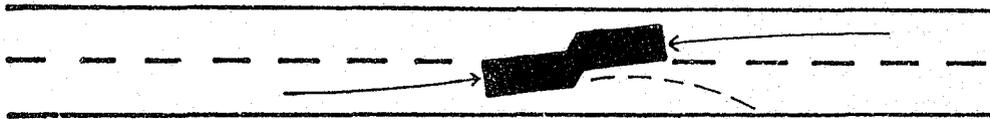


Motor vehicle on roadway goes out of control, skids, runs off the roadway, collides with a tree, injuring occupants and damaging motor vehicle.

*Source: Figure 6, page 57, Manual on classification of motor vehicle traffic accidents © 1970, National Safety Council, Chicago, Illinois, used with special permission. See also the Maryland Automated Accident Reporting System.

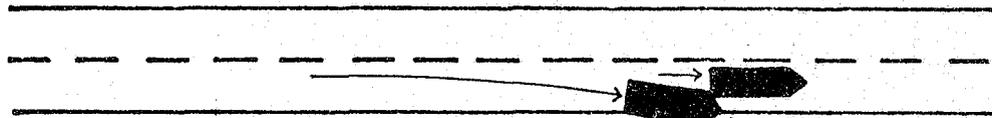
Exhibit 2-3
Multiple collision events*

1. On Roadway - Collision Involving Motor Vehicle



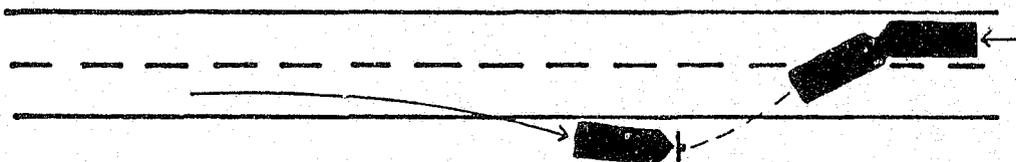
Two motor vehicles collide on roadway, motor vehicles are damaged, one motor vehicle leaves roadway, runs onto sidewalk, and injures a pedestrian.

2. Off Roadway - Collision Involving Pedestrian



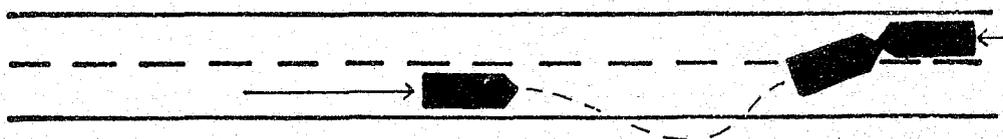
Two motor vehicles on roadway bump, there is no injury or damage, one motor vehicle leaves the roadway, runs onto sidewalk, and injures a pedestrian.

3. Off Roadway - Collision Involving Fixed Object



Motor vehicle on roadway leaves roadway, knocks down a breakaway traffic sign, damaging motor vehicle and sign, returns to roadway, collides with motor vehicle on roadway, injuring occupants and damaging motor vehicles.

4. On Roadway - Collision Involving Motor Vehicle



Motor vehicle on roadway runs off roadway, there is no injury or damage, motor vehicle returns to roadway and collides with another motor vehicle on roadway, injuring occupants and damaging motor vehicles.

*Source: Figure 7, page 58, Manual on classification of motor vehicle traffic accidents © 1970. National Safety Council. Chicago, Illinois, used with special permission. See also the Maryland Automated Accident Reporting System.

Severity of Motor Vehicle Traffic Accidents

In Maryland the categories applied to the classification of the extent of injury and damage resultant from a motor vehicle traffic accident are:

- Injury severity

- Fatal
- Incapacitating
- Non-incapacitating (evident)
- Possible injury
- No injury

or

- Fatal accident
- Non-fatal injury
- Non-injury (damage only)

- Damage severity

- Disability
- Functional
- Other motor vehicle
- Other property
- No damage



Motor vehicle

Other property

Anatomy of an Accident

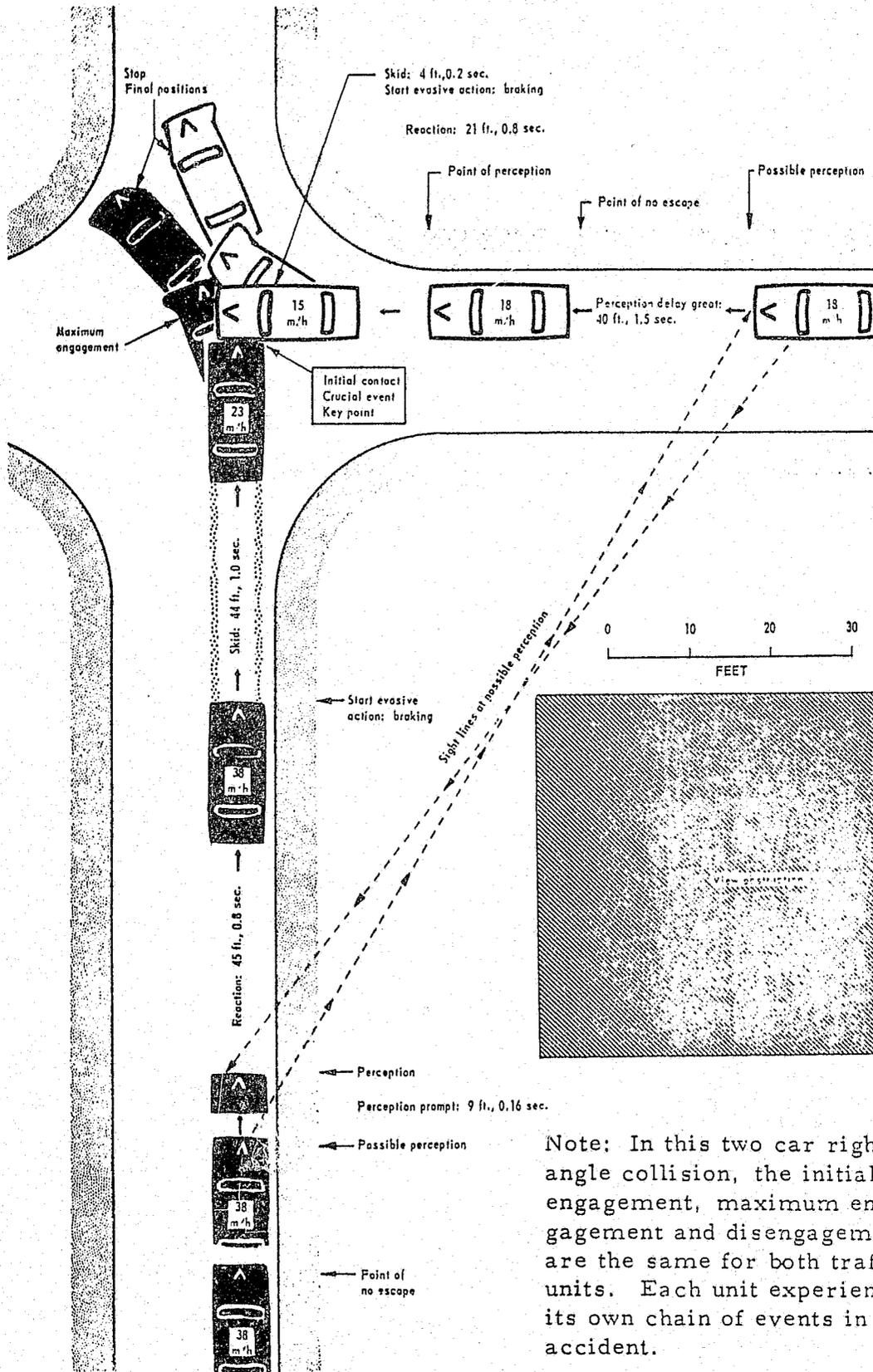
Accident Events

Every accident is brought about by a sequence of events--a sequence of unexpected and uncontrolled events that leads to damage and/or injury. An understanding of these typical classes of events or phases, will help the patrolman in his investigation of the causes of and circumstances surrounding a traffic accident. The basic categories of events are listed below; not every accident has all of these events and these events do not always occur in this order:

1. Point of possible perception (of hazard)
2. Point of actual perception (of hazard)
3. Point of no escape
4. "Point of initial contact"
5. Point of maximum engagement
6. Point of disengagement
7. Final position.

Exhibit 2-4 illustrates the occurrence of these events for a right angle collision, and a detailed discussion of each event appears below.

Exhibit 2-4
Anatomy of an accident*



Note: In this two car right-angle collision, the initial engagement, maximum engagement and disengagement are the same for both traffic units. Each unit experiences its own chain of events in the accident.

*Source: Exhibit 11-2, page 11. Traffic accident investigator's manual for police © 1963, Northwestern University, Evanston, Illinois, used with special permission.

1. Point of Possible Perception

This is the time and place at which the hazardous situation COULD HAVE BEEN PERCEIVED by a normal person. This point always precedes the point of actual perception. Perception time is the time between point of possible perception and point of actual perception. Maximum delay of perception is achieved when a traffic unit does not perceive a hazard until physical contact is made.

2. Point of Actual Perception of Hazard

This is the point at which an individual sees, feels, hears or otherwise perceives an indication that an accident is about to occur (e.g., seeing an opposing vehicle cross the barrier line, hearing a horn on your left as you are about to change lanes, feeling the right wheels drop from the road to a soft shoulder, or feeling the start of a skid). The points of possible and actual perception are analyzed to determine the contribution of drivers and pedestrians to accidents. The time between the two points is of particular interest. The point of actual perception identifies the point at which evasive action should be taken.

3. Point of No Escape

This refers to the place and time after which a given individual cannot avoid or prevent an impending accident. Occasionally, the point of perception and point of no escape are one in the same. In other cases, the point of no escape precedes the point of perception. Frequently, the point of no escape follows the point of perception, indicating faulty judgment and/or skill in the execution of evasive action.

4. "Point of Initial Contact"

This is the point where contact is first made during a collision. Before this point, no mutual force is exerted between the objects. After this point, force begins to develop.

5. Point of Maximum Engagement

This is where the greatest collapse of material or overlap of objects occurs. The greatest force is exerted between objects at this point. This always follows the key event, and immediately follows the initial engagement.

6. Point of Disengagement

This refers to the point at which the objects or units involved in the collision start to separate from one another, and the initial force exerted between them ceases. Complete disengagement does not occur in all accidents.

7. Final Position

This is the time and place that the objects which have collided come to rest, without the use of any power. This position may be difficult to determine if vehicles leave the scene, or roll down an incline after engagement. Vehicles may still be engaged at the final position. Often the final position of passengers or cargo may be quite different from the vehicles in

question. The final positions of vehicles and related objects are quite useful in reconstructing the accident. Traffic units do not have a "final position" if power is applied to move them. Drivers often move their vehicles to a safer position after a collision.

5. Directions: Identify the type of collision by placing the letter from Column B on the appropriate line provided in Column A.

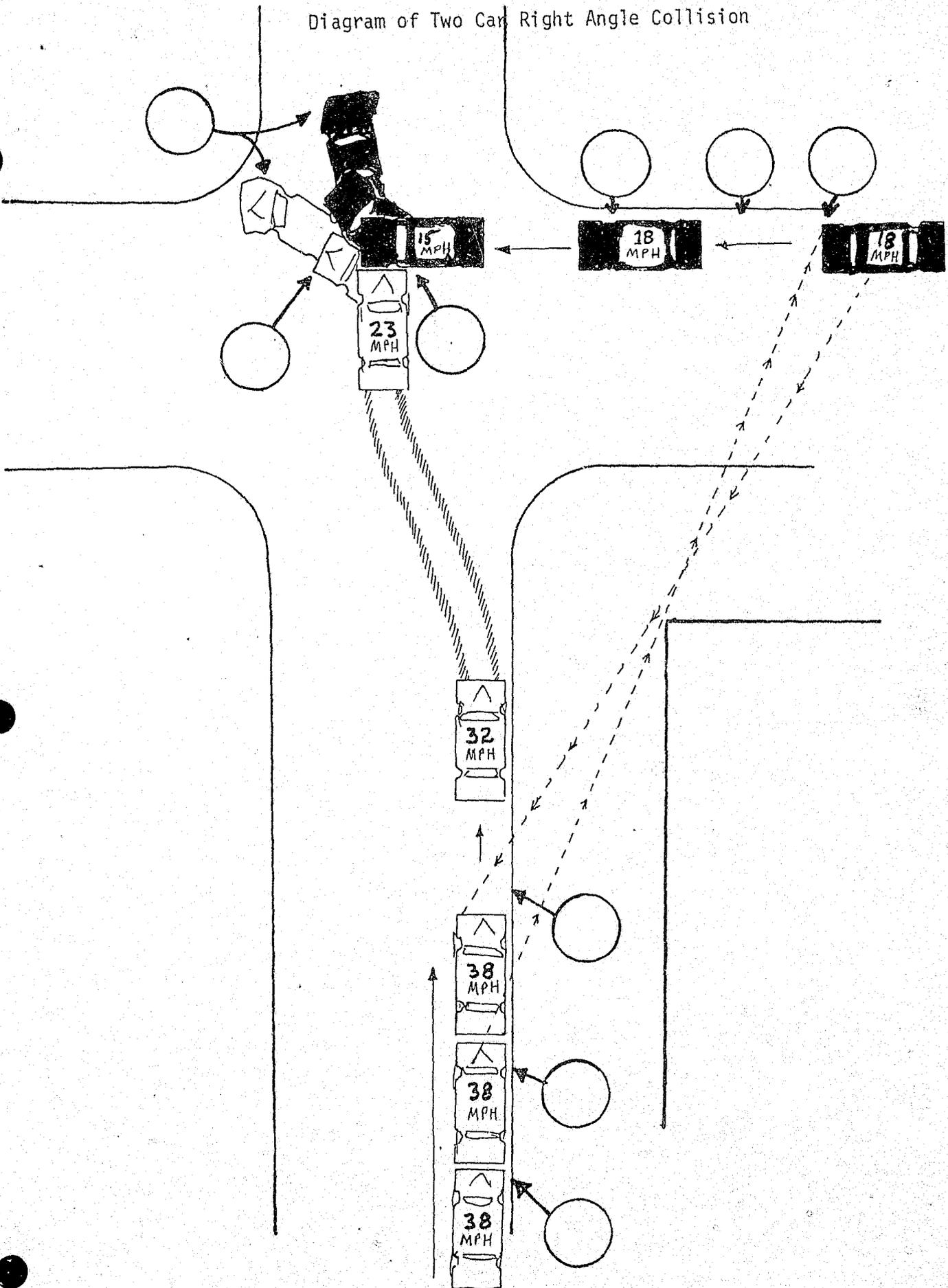
COLUMN A

COLUMN B

- | | |
|--|---|
| <p>_____ 1. Motor vehicle on roadway goes out of control; skids; runs off the roadway; collides with a tree, injuring occupants and damaging motor vehicle</p> <p>_____ 2. Motor vehicle on roadway leaves roadway, knocks down a breakaway traffic sign, damaging motor vehicle and sign; returns to roadway; collides with motor vehicle on roadway, injuring occupants and damaging motor vehicles</p> <p>_____ 3. Motor vehicle on roadway strikes pavement defect; there is no injury or damage; motor vehicle goes out of control; leaves roadway; overturns, injuring occupants</p> | <p>a. non-collision</p> <p>b. multiple-collision</p> <p>c. single-collision</p> |
|--|---|
6. Study the following diagram of a two-car right-angle collision and identify each of the events as follows:
1. Point of possible perception
 2. Point of actual perception of hazard
 3. Point of no escape
 4. Key event/key point
 5. Point of initial engagement
 6. Point of maximum engagement
 7. Final position.

Label each of the areas on the diagram marked with an arrow with the number (1-7) corresponding to the correct event given in the above list.

Diagram of Two Car Right Angle Collision



Causes of Traffic Accidents

Finding the causes of accidents, the how and why, is the major purpose of accident investigation. The cause of an accident is defined as "a combination of simultaneous and sequential circumstances (factors), without any one of which, the accident could not have happened." The source of causes of an accident can come from any one or all of the three elements of the highway transportation system: the people, the vehicle, and the trafficway. These sources produce contributing factors or accident causes.

Operational Factors

These are sometimes called "direct" causes of accidents and include such activities as control of traffic units within established paths of the roadway, and driving strategy, e.g., the adjustment of maneuvers and speed to roadway and environmental conditions. In more specific terms, these factors relate to inadequacies in the following areas of traffic unit control:

- Perceiving situations requiring action
- Deciding upon an appropriate course of action
- Responding to the situation with the correct action.

To determine at which point safe operations have failed, will enable the accident investigator to determine how the accident occurred.

Specific Sources of Operational Factors

Delayed perception or unresponsiveness to the traffic situation caused by preoccupation, distraction, or sensory interference, is often identified

as an operational factor. Violations of traffic laws which define an optimum and safe driving strategy, are a source of many operational factors, especially those laws dealing with the "rules of the road." Evasive action is the reaction of a traffic unit to avoid a hazardous situation that is likely to result in a collision. Evasive action may be completely successful (the accident is avoided), partially successful (a likely serious accident is reduced to a minor accident), or unsuccessful (a serious accident results). The major types of evasive action that may be used singly or in combination are slowing or stopping, speeding up, backing, and turning right or left. Common forms of ineffective evasive action are wrong actions such as making a wrong turn, sounding the horn instead of maneuvering, braking instead of speeding up, etc. In addition, there can be delayed actions due to indecision and confusion, or the expectation that the other traffic unit will stop or change course.

Condition Factors

These are sometimes referred to as "mediate" causes of accidents and include deficiencies in the ideal characteristics or attributes of the trafficway, people, and the vehicle. Examples of attributes are:

- Trafficway--traction available
- People--psychomotor skills in maneuvering the vehicle
- Vehicle--braking effectiveness.

The attributes of factors can be modified by other conditions called "modifiers." Modifiers change the attributes of the trafficway, people, or vehicle from a satisfactory state to a generally hazardous state. Examples of modifiers are listed below:

- Trafficway--ice or rain on road surface
- People--intoxication or fatigue
- Vehicle--leakage of brake fluid, extreme wear of brake lining, worn tires.

Discovering the deficiencies in the attributes of major classes of condition factors will enable the patrolman to explain why safe operations failed, as these deficiencies in condition factors influence the operational factor(s) or direct cause(s) of the accident.

Exhibit 2-5 shows some examples of attributes and modifiers for the trafficway, people and the vehicle. The lists of factors presented in this exhibit are not exhaustive, but serve as examples only. The distinction between attributes and modifiers is not always precise. Some modifiers act quickly, some act slowly. Some have a permanent effect, others have a temporary effect. Attributes vary from time to time, due to the changing nature of the modifiers. A temporary modifier like blood alcohol has a relatively quick effect on increasing reaction time. A modifier like aging has a slow but permanent effect on increasing reaction time.

Exhibit 2-5
Condition factors - attributes and modifiers*

Trafficways			
Attributes		Modifiers	
Generally relating to Performance	<ul style="list-style-type: none"> . Alignment . Surface character . Dimensions . Restraining devices 	Temporary	<ul style="list-style-type: none"> - Weather, atmospheric conditions - Natural light - Temporary warning devices
Generally relating to Decision	<ul style="list-style-type: none"> . Signals . Traffic signal controls . Regulatory signs and markings 		<ul style="list-style-type: none"> - Temporary roadside activities - Roadside objects - Objects on the road - Loss of alignment - Social and legal symbols
Generally relating to Recognition	<ul style="list-style-type: none"> . Light . Visibility . View obstructions . Recognizability . Recognizability aids . Distractions, monotony . Confusion, standardization . Warning signs . Guide signs 	Permanent	<ul style="list-style-type: none"> - Surface deposits, ruts - Road damage, holes - Wear - Deterioration, age
People			
Attributes		Modifiers	
Generally relating to Performance	<ul style="list-style-type: none"> . Operating skill, habits . Size, weight, strength . Freedom of movement 	Temporary	<ul style="list-style-type: none"> - Sun exposure - Glasses, etc. - Emotional upset - Pressure, stress, hurry - Preoccupation - Weather
Generally relating to Decision	<ul style="list-style-type: none"> . Intelligence, judgment . Attitudes . Emotional stability . Alertness, concentration 		<ul style="list-style-type: none"> - Irritants - Ingestion, inhalation - Fatigue, boredom - Temporary illness - Injury - Clothing
Generally relating to Recognition	<ul style="list-style-type: none"> . Observing habits . Sensory abilities . Signaling habits . Recognizability (mainly pedestrian) . Knowledge 	Permanent	<ul style="list-style-type: none"> - Things carried - Prosthetic devices - Deterioration, age - Chronic illness - Permanent injury - Experience, training - Customs, tradition - Authority, enforcement

Exhibit 2-5 (Continued)
Condition factors - attributes and modifiers*

Vehicles	
Attributes	Modifiers
Generally relating to Performance <ul style="list-style-type: none"> . Control arrangement, function . Operating space . Dimensions . Weight . Performance . Stability 	Temporary <ul style="list-style-type: none"> - Glare - Weather - Surface deposits - Cargo - Passengers - Social and legal symbols - Adjustment loss, defective parts - Damage, contamination
Generally relating to Decision <ul style="list-style-type: none"> . Comfort . Symbolism . Automatic controls 	
Generally relating to Recognition <ul style="list-style-type: none"> . Recognizability . Recognizability aids . Road illumination . Sensory aids . View obstructions . Distractions . Instruments . Signaling devices . Control feedback 	Permanent <ul style="list-style-type: none"> - Deterioration, age - Irreparable damage - Wear

*Sources: Exhibits 11-11, 11-12, and 11-13, pages 36-38, Traffic accident investigator's manual for police © 1963, Northwestern University, Evanston, Illinois, used with special permission.

Interaction and Multiplicity of Causes

There must be at least one operational and condition factor present to cause an accident. Usually several of each are necessary to cause a traffic accident. Thus, a combination of several factors is usually responsible for an accident. It is therefore not always easy to identify the most important factor or cause of an accident; when an attempt to do this is made, usually the most conspicuous or controllable factor is identified.

Commonly Discussed Causes of Accidents

Some of the frequently identified causes of accidents are discussed below.

Speed

Speed could be considered a factor in every traffic accident, since without movement, two bodies cannot collide. Inappropriate or unsafe speed for the conditions of the highway transportation system is really the key point to note. Inappropriate speed may result in the inability for a vehicle to negotiate a curve without skidding or leaving the road. Excessive speed can provide an element of surprise and hazard for the driver, such that he is beyond the point of no escape at his point of perception. For example, high speed may preclude a driver from successfully evading an unexpected obstacle. On a high speed roadway, a slowly moving or stopped vehicle can present a real hazard. There is a very definite and commonly observed relationship between speed, delayed perception, and inadequate evasive action. Delayed perception, as such, is not a specific traffic offense in most jurisdictions. It is often referred to or covered in laws which make "careless," "reckless," or "driving so as to endanger" illegal.

Failure of the Driver to Cope with the Traffic Situation

There are several ways in which driver performance can contribute. Carelessness is a factor which can apply to such attributes of individuals as

lack of skill, but largely refers to an attitude of disregard or inattentiveness to important features of the highway environment that is required for safe travel.

Negligence is basically the same as carelessness but more associated with specific law violations.

Recklessness generally refers to a "willful or wanton disregard for the safety of persons or property." It can be an operational factor in terms of the decision making performance of an individual. It also can be an attribute of an individual such as attitude, state of emotional instability, etc.

Specific Violations of Traffic Laws

Most hazardous behavior on the part of drivers/vehicles and pedestrians constitute a violation of one traffic law or another. Most hazardous conditions of vehicles and drivers constitute violations of traffic laws. Police and legal authorities tend to think of accident causes as specific violations of traffic laws. Many accident report forms call for only law violations as accident causes. Some of the frequently occurring contributing factors identified by law enforcement agencies as major causes of accidents are:

- Speed too fast for conditions
- Failure to yield right-of-way
- Failure to keep safe distance (following too closely)
- Drove left of center
- Made improper turn

- Improper overtaking
- Improper lights; defective brakes or steering
- Ignored traffic control device
- Drove while under the influence of alcohol or drugs.

All facts surrounding an accident must be considered. For example, Maryland policy indicates that even if a driver is not at fault but the evidence indicates he is driving while intoxicated, he must be charged.

Purposes of Accident Reporting and Investigation

The information forthcoming from the conscientious efforts of police in reporting and investigating accidents will directly support several activities. For instance, it is necessary to identify and document the causes and circumstances of accidents so that accidents may be prevented or reduced in the future through improvements in such accident prevention programs as:

- Traffic law enforcement
 - Selective enforcement by police with respect to the time, place, and frequency of accidents and associated traffic law violations
 - Prosecution in the courts
- Traffic engineering
- Traffic education
 - Driver education
 - Public safety education
- Highway safety research
- Traffic legislation
- Driver regulation/licensing.

Moreover, accident reporting and investigation enables the patrolman to make a responsible decision as to whether there is sufficient evidence of law violation associated with an accident to take law enforcement action.

Note: See Motor Vehicle Laws of Maryland, Article 66 1/2, Subtitle 10; and 16.110.

Attributes of a Good Accident Investigator

The patrolman should exhibit certain qualities and attributes, during the conduct of an accident investigation, which will increase the chances for obtaining the most complete and accurate description of the circumstances surrounding the traffic accident.

Investigative Activities for the Patrolman

During the investigation, the patrolman is basically concerned with seeking facts, recording information (via accident report and other official forms), and forming opinions. In seeking information and facts, the patrolman will be involved in asking questions and listening carefully to what people say, looking critically at the physical conditions of the accident scene, measuring lengths of roadmarks and distances between objects, feeling things-- like the temperature of a radiator to determine how long the engine has been stopped, and smelling odors to determine the character of substances (e.g., flammable substances, water, burned rubber, etc.). How much information the patrolman can obtain is variable. If only the accident report is to be executed, then a minimum of information is required. If the patrolman is to draw conclusions about the accident for law enforcement purposes, then he will need more information. Sometimes an insignificant accident (for law enforcement purposes) results in a major civil suit involving the at-the-scene officer's observations. The patrolman, to protect himself and the department, should investigate every accident as fully as necessary. Recording information will involve completion of the accident report forms and supplementary field

notes, as well as the taking of photographs where useful. Photographs should never be thought of as a substitute for keen observation and the documentation of physical conditions. In forming opinions, the patrolman will analyze and evaluate the body of facts he has assembled, to reconstruct the accident as well as find the cause(s) of the accident.

Qualities of a Good Accident Investigator

A good accident investigator is one who is intelligent, observant, energetic, determined, skeptical, patient and diplomatic.

The patrolman should develop habits of objective and critical thinking. In the information that he secures or receives, he must learn to separate opinion from fact. Webster's dictionary defines a fact as "something that has actual existence: an actual occurrence...information having objective reality." As valuable as it is, the patrolman should always be skeptical of the information about an accident contained in the reports of people at the scene. People may have ulterior motives and consciously distort the truth or unwittingly distort the facts. Reported information should always be correlated with observed physical conditions and evidence. In the accident report form and supplementary field notes, the patrolman should record only facts, where indicated, to the best of his ability. Any evaluations made by the patrolman may be expressed in any law enforcement action he might take or any supplementary accounts of the accident he may develop. When arriving at conclusions, the patrolman should be careful to identify the facts which led him to his conclusions.

The good investigator should be careful to distinguish between the circumstances surrounding an accident and the factors which contributed to the accident. Because a patrolman discovers that one of the drivers in an accident had consumed an alcoholic beverage, he should not jump to the conclusion that the accident was caused by a driver who was "under the influence of alcohol." All the facts surrounding an accident must be considered.

The patrolman should never let his prejudices affect his investigative procedures. The personalities of individuals should never sway the patrolman from his objective evaluation of the accident scene. Although a traffic accident is often the result of a violation of one or more traffic laws, it is not always the case. Unless the evidence clearly indicates a violation, no charge should be made.

The patrolman should never allow himself to view accident investigation as a routine matter. There is always something unique about every accident. Despite observed similarities between an accident in question and some other one(s) investigated in the past, the patrolman should never abandon a thorough inquiry into the circumstances surrounding the present accident.

The patrolman should never slight his obligation to render assistance at the scene. In most cases, the persons involved in accidents have never experienced an accident before. An accident is a new and frightening experience for the principals, one which the patrolman can ease by showing understanding and being as helpful as possible. If the patrolman exhibits the qualities of patience, tact, and understanding, as well as a polite and

courteous manner, he will not only help the cause of the principals of the accident, but his own as well. As with a traffic law enforcement stop, the experience of a traffic accident often arouses strong emotions in the parties involved (e.g., fear, anger, etc.). Coping with individuals in emotional states places a great burden on the patrolman. However, the forbearance and understanding of a patrolman at the scene will increase the chances of gaining the cooperation of the principals and witnesses at the scene and make potentially valuable sources of information available to the investigating patrolman. If the individuals involved in an accident leave the scene of an accident feeling that they were fortunate to have had the patrolman there to assist them, then a great service has been done for both the patrolman and his department.

Directions: Circle the letter of the one item which best completes the following statements.

7. Specific sources of operational factors are:
 - a. evasive action
 - b. violations of traffic laws
 - c. delayed perception
 - d. all of the above.

8. Attributes:
 - a. are characteristics of trafficways, people, and vehicles
 - b. relate to performance, decision, and recognition
 - c. both a and b
 - d. neither a or b.

9. A permanent vehicle modifier may include:
 - a. irreparable damage
 - b. passengers
 - c. both a and b
 - d. neither a or b.

10. Excessive speed:
 - a. may preclude a driver from successfully evading an unexpected object
 - b. may result in the inability for a vehicle to negotiate a curve without skidding or leaving the road
 - c. both a and b
 - d. neither a or b.

11. Which of the following is a major cause of accidents:

- a. speed too fast for conditions
- b. defective brakes or steering
- c. both a and b
- d. neither a or b.

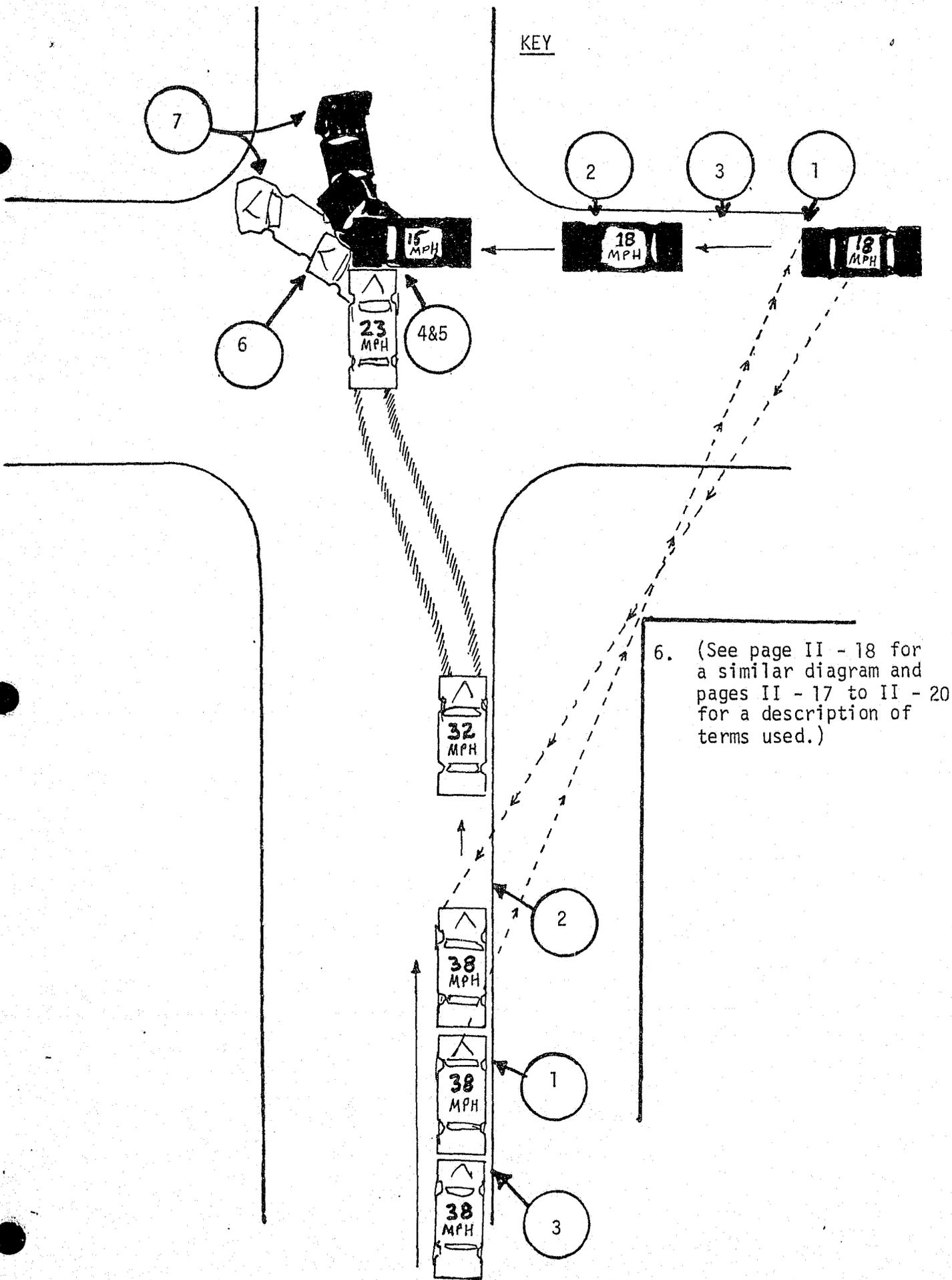
12. In order to protect self and the department, the patrolman:

- a. relies on photographs for law enforcement purposes
- b. investigates every accident as fully as necessary
- c. both a and b
- d. neither a or b.

Turn to page II - 39 to check your answers.

KEY

1. a. gather and document facts surrounding the accident.
(See page II - 3.)
2. a. failure to yield the right-of-way.
(See page II - 5.)
3. c. both a and b.
(See page II - 6.)
4. a. broken glass caused by propelled hard object.
(See page II - 8.)
5. 1. c. single collision.
2. b. multiple collision.
3. a. non-collision.
(See pages II - 13 and II - 15.)
6. See next page.
7. d. all of the above.
(See pages II - 24 and II - 25.)
8. c. both a and b.
(See page II - 25.)
9. a. irreparable damage.
(See page II - 28.)
10. c. both a and b.
(See page II - 29.)
11. c. both a and b.
(See pages II - 30 and II - 31.)
12. c. both a and b.
(See pages II - 33 and II - 34.)



KEY

6. (See page II - 18 for a similar diagram and pages II - 17 to II - 20 for a description of terms used.)

ACCIDENT TYPE			SUBSEQUENT EVENTS			
<input checked="" type="checkbox"/> 01	Overturned	05. Parked Mot. Veh.	09. Animal	<input type="checkbox"/> 10	<input type="checkbox"/> 06	<input type="checkbox"/>
<input type="checkbox"/> 02	Other Non-Collision	06. Pedestrian	10. Fixed Object			
<input type="checkbox"/> 03	Mot. Veh. in Transport	07. Pedalcycle	11. Other Object			
<input type="checkbox"/> 04	Mot. Veh. on other Roadway	08. Other Ped. Conveyance	12. Railway Train			

ACCIDENT TYPE

Every motor vehicle traffic accident consists of a series of events. In classification by type, one of these events must be selected before further classification can be made. This event must be one which can be easily determined by whomever classifies the accident. For uniformity in classification, select the event which is the first injury or damage producing event that can be determined to have happened in the accident, such as overturning, hitting a pedestrian, or other collision and enter its code in the first box on the left.

Often, there are other events which occur after the first damage or injury producing event which may be significant in describing the accident. If this is the case, enter appropriate codes for the next significant events in order of occurrence in the boxes on the right.

The twelve categories describing the nature of the accident are applicable to both 'On and Off Roadway' accidents.

Review the following definitions in order to make the best determination.

1. Overturned - Any accident in which a motor vehicle in transport overturns for any reason without an antecedent accident, or cause. This is a non-collision type accident.
2. Other Noncollision - Any accident involving a motor vehicle in-transport, other than Overturning and Collision. This includes accidental poisoning from carbon monoxide generated by a motor vehicle in transport; breakage of any part of the motor vehicle resulting in injury or further property damage; explosion of any part of the motor vehicle; fire starting in the motor vehicle; falling, jumping or being pushed from a motor vehicle in transport; hit by, or thrown against some part of, or object in, the motor vehicle in transport; object falling from, in or on the motor vehicle in transport; toxic or corrosive chemicals leaking from the vehicle; striking holes or bumps on the roadway; driving into water without overturning or colliding; etc.
3. Motor Vehicle in Transport - Any collision accident involving at least two motor vehicles in transport upon the same roadway, or upon roadways within an intersection.

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This includes collision with a motor vehicle stopped, disabled, or abandoned on a roadway other than in an area designated for parking but does not include collision with a motor vehicle on another roadway.

4. Motor Vehicle on Other Roadway - Any accident in which a motor vehicle in transport leaves the roadway on which it is in transport and collides with another Motor Vehicle in transport on another roadway.

This includes crossing the median and colliding on the opposite roadway; or crossing a shoulder and colliding on a frontage roadway but excludes crossing the center line of a multiple lane roadway, leaving a roadway and returning to the same roadway and collisions at intersecting roadways.

5. Parked Motor Vehicle - Any collision involving a motor vehicle in transport and a motor vehicle not in transport. This includes legally or illegally parked or standing vehicles (where normal usage permits such stopping) and also loads in the process of falling from such vehicles. This excludes motor vehicles stopped or parked in traffic lanes.

6. Pedestrian - Any accident involving a motor vehicle in transport and a pedestrian. This does not include a person boarding or alighting, jumping or falling from a motor vehicle in transport.

7. Pedalcycle - Any accident involving a motor vehicle in transport and a pedalcyclist in transport. Pedalcycles include bicycles, tricycles, and unicycles and any trailers or sidecars attached to these cycles.

A pedalcyclist is any person riding upon a pedalcycle or in a sidecar attached to a pedalcycle. A stopped pedalcycle is considered to be in transport if it is in readiness for transport.

8. Other Pedestrian Conveyance - Any accident involving a motor vehicle in transport and a person who is not classifiable as a pedestrian or as a pedalcyclist. This includes persons operating or being conveyed by scooters, wagons, skate-boards, sleds and skates.

9. Animal - Any accident involving a motor vehicle in transport and an animal, herded or unattended.

10. Fixed Object - Any accident involving a motor vehicle in transport and a fixed object.

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RELATIONSHIP TO INTERSECTION	
1	1. Non-Intersection Accident
2	2. Intersection Accident
3	3. Intersection-Related Accident
4	4. Driveway-Access Accident

RELATIONSHIP TO INTERSECTION

Choose the most appropriate classification for the accident from those listed below and enter the corresponding number in the box at the left.

1. Non-Intersection Accident - A motor vehicle traffic accident that does not occur within the confines of an intersection and is not caused by events at an intersection, or a driveway.
2. Intersection-Related Accident - Any motor vehicle traffic accident that occurs on the approach to, or exit from, an intersection which results from an activity, behavior, or control, affecting motor vehicle movement through the intersection which, in turn, affects motor vehicles on the approach to, or exit from, the intersection. If it cannot be clearly established that an accident is intersection related, assume that it is not related.
3. Intersection Accident - Any motor vehicle traffic accident in which the initial impact occurs within the limits of an intersection.
4. Driveway Access Accident - Any motor vehicle traffic accident that occurs on a driveway access or involves a vehicle that is turning into or out of a driveway access; or is crossing a trafficway from a driveway access on one side to a driveway access on the other side.

EXAMPLE:

A pedestrian moves into traffic on a crosswalk against a "no walk" signal, causing motor vehicles to stop, and approaching motor vehicle to collide on the approach to the intersection. You enter "3" for Intersection-Related Accident, since events occurring at the intersection caused the subsequent accident.

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KIND OF LOCALITY	
	1. Manufacturing or Indust'l.
	2. Shopping or Business
	3. Residential
17	4. School or Recreat'l.
	5. Open Country

KIND OF LOCALITY

Observe the accident locality for about 100 yards, in all directions, from the accident scene. Select the description that best describes the locality.

EXAMPLE:

An accident occurs on an entrance ramp of the expressway near a shopping mall. The rest of the locality consists of grass fields. Enter a "2" for Shopping or Business.

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CAUSE CODING
PRIMARY/SECONDARY

The terms Primary Cause and Secondary Cause deserve comment to eliminate any confusion that might exist. First, Primary and Secondary are of equal importance. Primary as used here means the actual violation or event that caused the accident to occur. Secondary is the contributing violation or event.

EXAMPLE:

The operator of a motor vehicle, under the influence of alcohol, crosses the center lane and strikes another vehicle head-on. The primary or actual cause is Fail to Drive Right of Center and the secondary or contributing cause is Use of Alcohol.

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Primary/Secondary Cause Coding

DRIVER RELATED

- 01 - Exceeding Posted Speed Limit
- 02 - Fail to Reduce Speed
- 03 - Speed too Great for Conditions
- 04 - Other Speeds
- 05 - Fail to Obey Stop Sign
- 06 - Fail to Obey Traffic Signal
- 07 - Fail to Obey Other Traffic Control
- 08 - Improper Passing
- 09 - Improper Turns
- 10 - Fail to Keep Right of Center
- 11 - Fail to Drive in Designated Lane
- 12 - Fail to Drive Within a Single Lane
- 13 - Fail to Yield Right of Way
- 14 - Following too Close
- 15 - Backing in Roadway
- 16 - Stopped on Roadway
- 17 - Driving Wrong Way on One Way
- 18 - Impeding Traffic
- 19 - School Bus Law
- 20 - Negligent Driving
- 21 - Use of Alcohol
- 22 - Use of Drugs

(continued)

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- 23 - Leaving Vehicle Improperly Unattended
- 24 - Transporting Hazardous Substances w/o Required or Inadequate Safety Devices or Precautions
- 25 - Blinded by Approaching Vehicle
- 26 - Drowsy or Asleep
- 27 - Physical or Mental Disability

VEHICLE RELATED

- 50 - Defective Vehicle Equipment
- 51 - Struck by Object from Moving Vehicle
- 52 - Fire

ENVIRONMENT RELATED

- 70 - Weather Elements
- 71 - Road Defects
- 72 - Parking Violations
- 73 - Animal - Wildlife
- 74 - Animal - Domestic
- 75 - Foreign Object or Substance on Roadway

MISCELLANEOUS

- 90 - Pedestrian at Fault
- 91 - Pedalcyclist at Fault
- 92 - Other Cause (other violation)
- 93 - Other Cause (no violation)
- 94 - Cause Unknown

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Definitions

- 01 Exceeding Posted Speed Limit - If the investigating officer can determine that the posted speed limit was exceeded, and was a factor in the accident, either primary or secondary, he should so indicate.
- 02 Fail to Reduce Speed - To be used when an accident is caused by the operator of a vehicle failing to reduce speed to avoid colliding with any person, vehicle, or other conveyance. Example: Vehicle #1 is stopped at traffic light; vehicle #2 fails to stop and runs into the rear of vehicle #1. Primary cause is Fail to Reduce Speed. Secondary cause would probably be negligent driving.
- 03 Speed too Great for Conditions - Applicable when special hazard(s) exist that require reduction in speed such as when approaching and going around curve, narrow or winding roadway, heavy traffic, or adverse road conditions.
- 04 Other Speeds - To be used only when speed has been determined as either the primary or secondary cause and does not apply to the more specific speed codes.
- 05 Fail to Obey Stop Sign - Applies when accident is caused by failure to stop at intersection marked with a stop sign. Does not include stop light. If the driver cannot stop in such a manner so as to see traffic on the intersecting roadway before entering the intersection, but has stopped and "rolled forward", he has obeyed the stop sign but has failed to yield right of way - code 13.
- 06 Fail to Obey Traffic Signal - Applicable when operator of motor vehicle fails to obey any device, whether manually, electrically, or mechanically operated, by which traffic is alternately directed to stop and permitted to proceed. Includes stop light, railroad signal, etc. Does not include stop sign.
- 07 Fail to Obey other Traffic Control - Includes police officer, flagman, etc., but does not include lane markings.
- 08 Improper Passing - Includes passing in no-passing zones, on grades, curves and intersections, but does not include passing stopped school bus.

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- 09 Improper Turns - Includes U-turns, turns from wrong lane, fail to signal, improper signal.
- 10 Fail to Keep Right of Center - To be used when failure of driver to stay right of the center line is a cause of the accident. If the driver swerves to avoid an animal or pedestrian improperly on the roadway, thus crossing the center line, code 10 is the secondary not the primary cause.
- 11 Fail to Drive in Designated Lane - To be used when operator of vehicle involved fails to drive in lane designated by some type of traffic control. For example, signs designating "All trucks use Right Lanes", Left turn lanes, etc. Not to be confused with Fail to Drive Within a Single Lane which is a separate code.
- 12 Fail to Drive Within a Single Lane - On multiple lane roads where the operator of the vehicle involved fails to drive his vehicle completely within a single marked lane causing his vehicle to come into contact with another.
- 13 Fail to Yield Right of Way - Example for clarification: Vehicle stops for stop sign, but does not wait for traffic to clear before proceeding and strikes, or is struck by, another vehicle.
- 14 Following too Closely - In the case of trucks or other slower moving vehicles, following one another, enough space must be left to permit an overtaking vehicle to enter and occupy the space without danger. In other cases the decision of a "prudent distance" is left to the investigator.
- 15 Backing in Roadway - The motor vehicle is traveling in reverse on the roadway. Does not include backing into a roadway.
- 16 Stopped in Roadway - Motor vehicle stopped in traffic lane.
- 17 Driving Wrong Way on One Way - Driving or turning the wrong way on a one-way street, ramp, or roadway of a divided highway; not having crossed a median.
- 18 Impeding Traffic - Includes not only motor vehicles, but also farm vehicles, motorized road and construction equipment, but does not apply to animals, pedalcyclist, or pedestrian.

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- 19 School Bus Law - To be used for any violation of the school bus law that results in an accident. Example 1: Vehicle passes stopped school bus with flashing lights activated. Passing vehicle strikes child alighting from bus - Primary Cause Code - School Bus Law. Example 2: Vehicle passes stopped school bus unloading children, but operator of bus failed to activate flashing lights and vehicle strikes child. Primary Cause Code - School Bus Law. Example 3: School bus stopped, unloading children, operator of bus turned lights on, but they failed to work. Child is struck by passing vehicle. Primary Cause - Equipment Violation, not School Bus Law.
- 20 Negligent Driving - Includes Inattention and Reckless Driving. Should only be used when absolutely necessary. Use more specific code when possible.
- 21 Use of Alcohol - To be used when alcohol adversely affected the operator's actions. Normally a secondary cause rather than primary. Example 1: Operator of motor vehicle, under the influence of alcohol, crosses center lane and strikes another vehicle head-on. Primary Cause - Fail to Keep Right of Center. Secondary Cause - Use of Alcohol. Example 2: Operator of motor vehicle, not under the influence of alcohol, crosses center lane and strikes second vehicle head-on. Operator of second vehicle is under the influence, but is not responsible for the accident. Primary Cause - Fail to Keep Right of Center. Secondary Cause would not be Use of Alcohol.
- 22 Use of Drugs - Same application as alcohol.
- 23 Leaving Vehicle Improperly Unattended - Includes such events as fail to set hand brake, fail to put transmission gear selector in "park", leaving vehicle running and transmission becomes engaged and vehicle strikes another vehicle, object or pedestrian.
- 24 Transporting Hazardous Substances Without Required or Inadequate Safety Devices or Precautions - Example: Log on truck, not properly secured, becomes askew and portion of log strikes a vehicle, object or pedestrian.
- 25 Blinded by Approaching Vehicle - If the operator of the vehicle responsible for the accident was blinded by the lights of an approaching vehicle, this should be so noted as factor.

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- 26 Drowsy or Asleep - This is usually a secondary rather than primary cause as in the case of alcohol or drugs.
- 27 Physical or Mental Disability - Includes physical and mental handicaps, illness, fainting, etc. Normally a secondary cause.
- 50 Defective Equipment - This is usually a secondary cause since defective equipment impairs the driver's ability to safely operate the vehicle.
- 51 Struck by Object from Moving Vehicle - Object must fall from responsible vehicle or in some way be set in motion. Example 1: Stone thrown from rear wheel(s) of moving vehicle. Example 2: Bottle thrown from moving vehicle. Example 3: If part of the load on a truck shifts and the overhang strikes another vehicle this code does not apply. Correct code would be #24 - Inadequate Safety Devices or Precautions.
- 52 Fire - To be used when fire is the only event or the event that caused further damage. Not to be used when the fire resulted from the accident.
- 70 Weather Elements - Heavy rains, flooding, slippery or icy roads, etc.
- 71 Road Defects - Example: Rut or hole in roadway catching the wheel and causing the car to swerve.
- 72 Parking Violation - If the vehicle in question met the criteria for a "Motor Vehicle in Transport" use code 16 (Stopped in Roadway). The code for Parking Violation should normally be used only as a secondary Cause.
- 73 Animal - Wildlife - Includes accident caused by striking or avoiding wildlife.
- 74 Animal - Domestic - Includes farm animals, horses, dogs and other pets.
- 75 Foreign Object or Substances on Roadway - To be used when foreign objects or substances are on the roadway and contribute to the accident. Includes gravel, oil, gasoline, dirt, pieces of tire, boxes, lumber, etc.

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- 90 Pedestrian at Fault - Example: Pedestrian emerging without warning on roadway and not at pedestrian crossing.
- 91 Pedalcyclist at Fault - To be used when pedalcyclist causes an accident. Example: Pedalcyclist fails to yield right of way to motor vehicle. Do not use the code for Failing to Yield Right of Way, use code for Pedalcyclist at Fault.
- 92 Other Cause (Other Violation) - To be used only when a violation occurred that was a contributing factor to the accident, but does not have an appropriate code provided.
- 93 Other Cause (No Violation) - To be used only when an event (not violation) occurred that was a contributing factor to the accident, but does not have an appropriate code provided.
- 94 Cause Unknown - To be used in those rare cases when investigation fails to reveal a probable cause.

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END