

# **Regional Transportation Safety Information Management System (RTSIMS) Phase I**

## **Technical Memorandum No.4**

### **Table of Common Definitions**

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## Executive Summary

The Maricopa Association of Governments (MAG) has embarked on developing a Regional Transportation Safety Information Management System (RTSIMS) that will serve as the primary crash data analysis tool for MAG. The RTSIMS will provide an efficient and user-friendly interface for performing various statistical analyses to gain a better understanding of transportation safety in the region. Development of the RTSIMS will be accomplished in three phases. This report documents the results of the final task of the first phase. This task involved a workshop to which representatives from all MAG member agencies, and other key stakeholders were invited. The workshop goal was to review the different definitions of data fields and data attributes associated with the Accident Location Information Surveillance System (ALISS) database used by MAG and MAG member agencies. The differences in definitions were identified in the penultimate task and are described in Technical Memorandum 3.

Although the preferred terminology is “crash” instead of “accident” these are both used interchangeably in this document.

The primary issues that the workshop focused dealt with the following definitions:

- Eight of the twenty-four interviewed MAG member agencies had some guidelines /definitions that they used in their crash analysis. These eight entities have a distance-based threshold or a definition different from that of ADOT for identifying “intersection related crashes pertaining to a given intersection. These thresholds vary between 50 feet to 250 feet from the center of the intersection.
- The left-turn accidents were identified either based on “Manner of Collision” or based on “Direction of Travel” in Arizona Traffic Accident Report form. A general distinction between left-turn accidents and angle accidents used by the MAG member agencies is the fact that the vehicles involved in left-turn accidents should have been traveling in opposite directions while the vehicles involved in angle accidents would have been traveling in adjacent directions

The workshop resulted in a consensus among participants on common definitions. The following common definitions were agreed upon by all of the participants, to be used by MAG and optionally by its member agencies.

Intersection-Related: A traffic accident where the first harmful event (1) occurs on an approach to, movement through, or exit from an intersection (2) has resulted from an activity, behavior, or control related to the intersection.

Based on the information provided on the quality control measures used by ADOT in determining whether a crash is “intersection related”, the participants agreed that the “intersection related” crashes will be identified based on the “intersection\_related” variable in ALISS and a distance based logic need not be used for this purpose.



ADOT Traffic Records representatives explained that the left turn crashes are defined as crashes involving a left-turning vehicle and another vehicle traveling in the opposing direction (e.g. southbound vehicle for northbound left-turning vehicle). But the Manual of Instructions for use with State of Arizona Traffic Accident Report Forms suggests that left-turn crashes are those crashes that involve one or more left-turning vehicle(s). Since the definition used by ADOT Traffic Records for a left-turn crash differs from the definition in the Manual of Instructions, it was agreed to define a left-turn crash as follows:

Left Turn Crash: Crashes involving a left-turning vehicle and another vehicle traveling in opposing direction. Some may appear to be angle or head on.

Other definitions were adopted from the Manual of Instructions for use with State of Arizona Traffic Accident Report Forms and are also presented in *Appendix F*.

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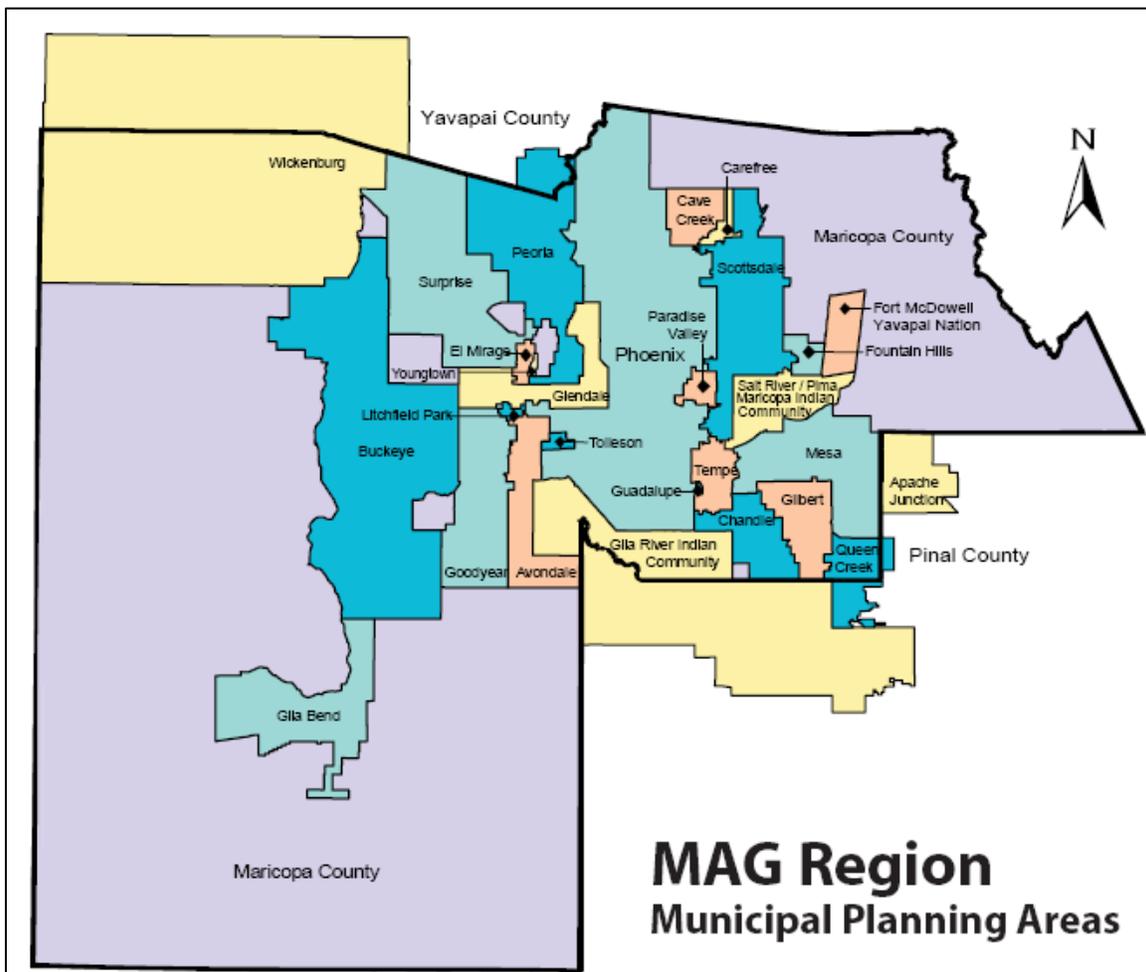
## Acronyms

ADOT	Arizona Department of Transportation
ALISS	Accident Location Identification Surveillance System
AT	Attributed Element
BIN	Binary Elements
FHWA	Federal Highway Administration
GHSA	Governors Highway Safety Association
MMUCC	Model Minimum Uniform Crash Criteria
NCSA	Nation Center for Statistics and Analysis under NHTSA
NHTSA	National Highway Traffic Safety Administration
OF	Open Field Element
SQL	Structured Query Language
SQR	Structured Query Reporter
TCD	Table of Common Definitions

# 1 Introduction

The Maricopa Association of Governments’ (MAG) region currently includes all entities within Maricopa County and the City of Apache Junction as shown in Figure 1. MAG serves as the designated Metropolitan Planning Organization for the Phoenix Metropolitan Region. MAG has embarked on developing a Regional Transportation Safety Information Management System (RTSIMS) that will serve as the primary source of road safety information and analysis to support regional planning activities. The RTSIMS will provide an efficient and user-friendly interface to perform various statistical analyses to improve the transportation safety in the region.

**Figure 1. Entities in MAG Region (Source: MAG Strategic Transportation Safety Plan)**



The Accident Location Identification Surveillance System (ALISS) database is maintained by ADOT and contains all of the crash reports provided to ADOT by the cities, counties and other local law enforcement entities within the State. The RTSIMS will contain ALISS data provided to MAG and other non-ALISS transportation data that are pertinent to the MAG region. It will also have the ability to integrate new crash data

into the crash data archive in an efficient manner and the ability to generate statistics and the corresponding graphics required for inclusion in MAG reports and for other purposes. The RTSIMS will also facilitate specific corridor safety analyses and the forecasting safety consequences of transportation planning alternatives.

Development of the RTSIMS is to be carried out in three phases. The goal of RTSIMS Phase I is to develop a Table of Common Definitions (TCD) for all the crash data fields currently included in MS Access<sup>®</sup> based ALISS database. There are five tasks included in Phase I. The first task of this project is project management and includes the kick-off meeting and briefings to MAG Transportation Safety Committee. In the next task, the variables/data fields in ADOT ALISS database were identified. Then, the ADOT ALISS database was compared to corresponding fields in MMUCC (Model Minimum Uniform Crash Criteria) guidelines and identified the actions needed for MMUCC compliance. In the next task, crash data definitions used by local agencies differing from ADOT's ALISS definitions were identified and presented as Technical Memo 3. The last task is to generate consensus on the definitions of crash data fields and develop a Table of Common Definitions (TCD) applicable for the MAG Region as appropriate. If consensus is not reached, it will document the differences in the definitions to be used by MAG member agencies.

This document (Technical Memorandum 4) focuses on the results of the last task of Phase I of RTSIMS development. In earlier deliverables (Technical Memos 1, 2 and 3), the structure of MS Access<sup>®</sup> based ADOT ALISS database and a comparison of ADOT ALISS with MMUCC were presented.

This document highlights the common definitions of crash data fields agreed upon by the MAG member agencies. To achieve this purpose, all MAG member agencies were invited to a workshop held at MAG offices to discuss the differences in the definitions of crash data fields used. This workshop was well-attended and notes from this workshop are attached as *Appendix E* of this document. At this workshop, the differences in the common definitions currently used by different MAG member agencies were discussed. The differences in definitions included the definition of “intersection related” crashes and “left turn” crashes. This led to a consensus on definitions for use by MAG in performing road safety analysis at the regional level. The following discussion focuses on the terms with different definitions among the various agencies and the agreed-upon definition.

## **2 ADOT ALISS Definitions**

In December 2000, ADOT published the 7<sup>th</sup> Edition of the Arizona Traffic Accident Report Instruction Manual and Glossary. This Manual has five parts.

- Part One contains instructions for filling out the front page of the Basic Accident Report (Form 01-2703 and Form 01-2704).
- Part Two has the instructions for filling the back page of the same form.
- Parts Three and Four contain instructions for filling out the Fatal Supplement (Form 01-2705) and Supplemental Truck/Bus Accident Report (Form 01-2710) respectively.

- Part Five of this Manual is a glossary of terms and definitions used in the Arizona Traffic Accident Report form. These definitions were extensively discussed at the workshop.

The five-part manual contains an exhaustive list of instructions for filling out the Arizona Traffic Accident Report form. It covers most of the definitions related to the terms used in the form. In previous tasks, this project identified two current definitions to be ambiguous. It was agreed that common definitions for these two terms (“intersection related” and “left turn crash”) were needed. The definitions currently contained in the Arizona Traffic Accident Report Instruction Manual are:

- Intersection Related: A traffic accident where the first harmful event (1) occurs on an approach to, movement through, or exit from an intersection (2) has resulted from an activity, behavior, or control related to the intersection.
- Left Turn: A left turn movement. Some may appear to be angle or head-on.

As demonstrated in Technical Memo 1, a few of these definitions/instructions lead to ambiguities both when filling out the Arizona Traffic Accident Report form and also in later crash analyses that use the ALISS crash databases based on information from Arizona Traffic Accident Report form or Police Accident Reports (PAR). All the ambiguities in these definitions identified in Technical Memo 1 were discussed at the workshop. The focus of the workshop, however, was the definitions for “intersection related” data element and “left turn” data attribute in ALISS.

### 3 MMUCC Definitions

The Model Minimum Uniform Crash Criteria (MMUCC) is a voluntary and collaborative effort to generate uniform crash data that are accurate, reliable and credible for data-driven highway safety decision-making throughout the country. It recommends voluntary implementation of a “minimum set” of standardized data elements to promote comparability of data across different jurisdictions.

MMUCC has 111 data elements and a total of 625 data attributes according to the guidelines published in 2003. 77 of these 111 data elements are collected on the scene while 34 of these elements are either derived or obtained through database linkages.

The MMUCC was consulted for the definitions of the previously identified two terms. The following discusses the definitions provided in the Model Minimum Uniform Crash Criteria (MMUCC) for the two terms of interest.

- Intersection Related (C16): Location of the crash next to an intersection and results from an action related to the movement of traffic units through the intersection.

- Left-Turn: Manner of Collision in MMUCC does not have a left-turn category. Refer to Appendix B attached with Technical Memo 2 for more details.

## **4 Current Definitions Used by MAG Member Agencies**

### **Definitions**

The questionnaire shown in *Appendix C* in Technical Memo 3 was used as the framework for interviewing the MAG member agencies as part of the RTSIMS Phase I project. The results of the interviews with member agencies of MAG were documented in Technical Memo 3. An effort was made to contact all of the MAG member agencies (i.e. thirty in total). Responses from twenty-eight were received and included in Technical Memo 3. These interviews were for approximately 15 minutes each. Based on these interviews, it was concluded that none of the interviewed entities used “*documented*” supplemental guidelines/definitions in addition to the “Arizona Traffic Accident Report Instruction Manual and Glossary”. Some of the entities had their own guidelines to define intersection related crashes. A comparison of these agency guidelines is provided in the following section.

#### **4.1 Differences in Definitions of the Term “Intersection Related”**

The following table (Table 1) summarizes the different definitions for intersection related crash used by the various agencies within the MAG region. In general, agencies not shown in Table 1 follow the ADOT definition. Seven of the eight entities also use a threshold based on the distance of the crash location from the center or the curb extensions of the nearest intersection.

Discussion among those agencies using these distance-based thresholds revealed that they are being used due to lack of confidence in the “Intersection Related” data field/check box on the Traffic Accident Report Form that is filled out by the investigating officer at the field.

**Table 1. Distance Based Thresholds for Identifying “Intersection Related” Crashes**

	<b>Entity</b>	<b>Distance</b>	<b>Other Modified Guidelines</b>	<b>Comments</b>
1	ADOT	250 feet		Provides data requesters with accidents within 250 feet from the center of intersection assuming that they will be closely examined for relationship to the intersection during analysis.
2	City of Chandler	200 feet (with exclusions)		
3	Maricopa County	100 feet		For planning purposes. Traffic engineering may use a different threshold.
4	City of Mesa	All Crashes Except Crashes on Exiting Legs	Crashes on the exiting legs of intersections are not included.	Use “intersection related” variable in Arizona Traffic Accident Report form and ALISS.
5	City of Phoenix	150 feet		
6	City of Tempe	200 feet		
7	City of Glendale	200 feet		Will still use “intersection related” variable in Arizona Traffic Accident Report form.
8	City of Scottsdale	100 feet		Distance measured from the curb line extensions.

Left-Turn Crashes:

There were no differences in how the “left-turn accidents” were being identified among the MAG member agencies. The left-turn accidents were identified either based on “Manner of Collision” or based on “Direction of Travel” in the Arizona Traffic Accident Report form. A general distinction between left-turn accidents and angle accidents used by the MAG member agencies is the fact that the vehicles involved in left-turn accidents should have been traveling in opposite directions while the vehicles involved in angle accidents would have been traveling in adjacent directions.

## **5 Common Definitions**

*Appendix F* of this document provides the Table of Common Definitions including those definitions agreed upon at the workshop as well as those that were adopted from the “Manual of Instructions for use with State of Arizona Traffic Accident Report Forms”. A comprehensive list of definitions/guidelines/instructions for all of the data fields and data

attributes in the MS Access based ALISS database were also listed in *Appendix A* with Technical Memo 1.

The participants of the workshop were presented the following ambiguities in the definitions of data fields and attributes in the ALISS database as identified in Technical Memo 1 along with an overview of Technical Memorandums 2 and 3.

- “Intersection Related” and “Type of Location” in Arizona Traffic Accident Report
- “collision\_manner” values in ALISS
- Left-Turn crashes in Arizona Traffic Accident Report and ALISS
- Direction of Travel in Arizona Traffic Accident Report
- Unusual Road Condition
- “Other” values for data fields

The workshop focused on discussing the following differences in definitions used by MAG member agencies identified in Technical Memo 3.

1. Eight of the twenty-four interviewed MAG member agencies had some guidelines / definitions used in their crash analysis including ADOT. These entities have a distance-based threshold or a definition different from that of ADOT for identifying “intersection related crashes pertaining to a given intersection. These thresholds vary between 50 feet to 250 feet from the center or curb line of the intersection.
2. The left-turn accidents were identified either based on “Manner of Collision” or based on “Direction of Travel” in Arizona Traffic Accident Report form. A general distinction between left-turn accidents and angle accidents used by the MAG member agencies is the fact that the vehicles involved in left-turn accidents were traveling in opposite directions, while the vehicles involved in angle accidents were traveling in generally perpendicular directions.

The workshop developed consensus on a common definition for the previously identified two terms. The following definitions were agreed upon by all of the participants to be used by MAG and optionally by its member agencies.

Intersection-Related: A traffic accident where the first harmful event (1) occurs on an approach to, movement through, or exit from an intersection (2) has resulted from an activity, behavior, or control related to the intersection.

It was found in the workshop that ADOT Traffic Records staff do not just accept the “intersection related” box being checked by the investigating officer, but rather look at other crash factors to determine if it is entered into ALISS as intersection related. Based on the information provided on the quality control measures used by ADOT in determining whether a crash is “intersection related”, the workshop participants agreed that “intersection related” crashes will be those identified based on the

“intersection\_related” variable in ALISS. A distance-based threshold will not be required for this purpose.

At the workshop, ADOT explained that left turn accidents are defined as crashes involving a left-turning vehicle and another vehicle traveling in the opposing direction (e.g. southbound vehicle for northbound left-turning vehicle) even though the Manual of Instructions for use with State of Arizona Traffic Accident Forms suggests that left-turn accidents are all crashes involving one or more left-turning vehicles. It was agreed by workshop participants that the definition of left-turn crash would be consistent with the definition being used by ADOT Traffic Records staff as follows:

Left Turn: Crashes involving a left-turning vehicle and another vehicle traveling in opposing direction. Some may appear to be angle or head on.

This change in language of the definition is highlighted with italicized bold text in *Appendix F*.

## 6 Conclusions

Definitions / Guidelines / Instructions listed in *Appendix A* of Technical Memo 1 along with the Table of common Definitions in *Appendix F* with this document provide the information needed for the subsequent phases of the Regional Transportation Safety Information Management Systems (RTSIMS) development.

## Appendix E: Regional Transportation Safety Information Management System (RTSIMS) Phase I Workshop Notes

### Agenda

Venue:  
 MAG Saguaro Room  
 302 N. 1<sup>st</sup> Ave, Suite 200  
 Phoenix, AZ -85003

Time:  
 1:00P.M. to 3:30 P.M.

<u>Time</u>	<u>Agenda Item</u>	<u>Presenter</u>
1:00- 1:15	Introductions	All Participants
1:15- 1:25	Project Introduction <ul style="list-style-type: none"> <li>• Provide overview / progress update of RTSIMS Phase 1</li> </ul>	MAG (Sarath Joshua) / Lee Engineering (Jim Lee)
1:25- 1:35	Meeting Objectives	Lee Engineering (Jim Lee)
1:35- 2:05	Overview of Differences <ul style="list-style-type: none"> <li>• Provide overview of differences identified in the definitions used by MAG member agencies</li> </ul>	Lee Engineering (Jim Lee)
2:05- 2:35	Overview of Options for Common Definitions <ul style="list-style-type: none"> <li>• Jim Lee will provide an overview of possible options for common definitions for identified differences</li> <li>• Other possible options identified by participants</li> <li>• All participants discuss the options and develop a set of possible definitions</li> </ul>	All Participants
2:35- 3:05	Develop Consensus <ul style="list-style-type: none"> <li>• Identify definitions with group agreement</li> <li>• Actions needed by individual agencies for the implementation of common definitions</li> </ul>	All Participants
3:05- 3:20	Draft Table of Common Definitions <ul style="list-style-type: none"> <li>• Summary of workshop discussions</li> <li>• Draft Table of Common Definitions</li> </ul>	All Participants
3:20- 3:30	Conclusion	

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## Participants

1. Leo Luo, MAG
2. Larry Talley, City of Mesa
3. Chris Plumb, MCDOT
4. Ed Fritz, MCDOT
5. Vicki Stewart, MCDOT
6. Luke Albert, City of Goodyear
7. Karen King, FHWA
8. Louis Lombardi, Salt River Police Dept.
9. Nancy Ann Crandall, ADOT (on the phone)
10. Lt. Mike Lockhart, Department of Public Safety (DPS)
11. Todd Taylor, City of Scottsdale
12. Erik Anderson, City of Phoenix
13. Srilatha Gajula for Kohinoor Kar, ADOT- HES
14. Julian Dresang, City of Tempe
15. Margaret Bonne-Pixley, City of Peoria
16. Bradley Shaw, City of Peoria Police Dept.
17. Ida van Schalkwyk, ASU (on the phone)
18. Jim Lee, Lee Engineering
19. Manju Kumar, Lee Engineering
20. Kiran Guntupalli, MAG
21. Sarath Joshua, MAG

## Workshop Notes

### Introduction:

Sarath Joshua from MAG started the meeting introducing the project and a brief overview on how the recommendations from this project will also help the state with one of the priority projects identified by the Arizona TRCC.

### Project Introduction / Meeting Objectives:

Jim Lee from Lee Engineering proceeded with an overview of RTSIMS Phase 1 and the progress of this project so far. He also detailed the objectives for the workshop

1. Provide an overview of the RTSIMS Phase 1
2. Discuss differences in definitions used by MAG Member Agencies
3. Develop a draft Table of Common Definitions (TCD)

Details on the progress of the project were provided.

### Overview of Differences / Developing Consensus:

Jim Lee started the overview of differences identified in definitions of crash data variables as part of this project. The following ambiguities identified in the first task of this project were also presented.

Ambiguity 1: “Intersection Related” and “Type of Location”

Ambiguity 2: “Collision\_Manner” values in ALISS

Ambiguity 3: Left-Turn crashes in Arizona Traffic Accident Report and ALISS

Ambiguity 4: Direction of Travel in Arizona Traffic Accident Report

Ambiguity 5: Unusual Road Condition

Ambiguity 6: “Other” values for data fields

An overview of ALISS and MMUCC comparison was also provided. Subsequently, the two critical differences in the definitions used by MAG member agencies were presented. The first difference was in the distance-based definitions for intersection-related crashes and the distances used in this definition were found to be varying between 100 ft. and 250 ft. among different MAG member agencies.

Nancy Ann Crandall from ADOT explained that her staffs that enter the ALISS crash data from accident reports read the descriptions of the accidents and use that information to determine whether the crash was intersection-related and do not always rely on the investigating officer’s indication whether the crash was intersection-related in the crash report. Ida van Schalkwyk from ASU asked if this definition was compared with the definition contained in American National Standards Institute (ANSI) for an intersection crash. Sarath responded that the objective of this project was to work with the ADOT & Member Agency definitions.

Jim Lee asked the participants whether there was a change in the confidence of the crash data variable “intersection related” in ALISS in light of the new information that ADOT crash data entry personnel determine whether a crash is “intersection-related” based on the description of the accident.

Larry Talley from Mesa conveyed that they differ that the crashes on the exiting legs of the intersection should not be included as “intersection related” crashes. Sarath explained that it may be appropriate to exclude crashes on the exiting legs of intersections for analyses that are focused on individual intersections. He added that it should not be a problem to also include the crashes on the exiting legs of intersections for region-wide analyses for being consistent across jurisdictions.

Sarath Joshua mentioned that MAG will be willing to use footnotes to explain the differences in the cities definitions as needed. Larry asked Nancy Ann whether the driveway / alley access related crashes get filtered by her staff. She explained that the driveway / alley access related crashes near intersections also get classified as driveway / alley access related and not as “intersection-related”.

Sarath Joshua assured the participants that MAG will consult and / or have the member agencies review of the analysis results before they are published for accuracy and the cities will have a chance to critique any analysis based on common definitions during their inputs.

Chris Plumb from Maricopa County brought to the attention of the participants an example of pedestrian crashes coded to a wrongful intersection by investigating officers. The intersection of Van Buren/32nd Street was identified as one of the highest pedestrian crash locations in Phoenix. A closer analysis of the crashes found that they were occurring at the airport terminal which is a mile from the intersection; however, this is the closest intersection to the crash locations. He also pointed out that 20 to 30 percent of the intersection crashes were assigned to the wrong jurisdictions as some approaches of the intersections are owned by different agencies. He emphasized that one ADOT definition is needed for the agencies to follow to ensure consistency.

Julian Dresang from Tempe mentioned that they have the flexibility of running two-different queries to identify intersection-related crashes. They can run a distance based-query and another query that identifies all crashes that were identified to be “intersection-related” in ALISS irrespective of their distance from the intersection.

The law enforcement representative from Salt River PD mentioned that the common definitions that are agreed upon in this meeting may not affect the way the police will investigate the traffic crashes at the crash locations.

Jim Lee at this point asked the participants whether there were any reservations on using just the “intersection related” variable in ALISS as the only criteria to identify crashes related to a particular intersection. Sarath added that a consensus definition will help the

crash analyses to be conducted by MAG. Margaret Bonne-Pixley of Peoria asked about the purpose for developing a table of common definitions as part of this Project. Sarath answered that the table of common definitions will be used in later phases of this project to developing a crash analysis tool for regional-wide crash analyses. This analysis will be used in comparing crashes rates across the region. He also reassured that MAG will not perform any microscopic analysis.

Jim Lee asked the participants for consensus on the common definition of “intersection related” crashes as identified by the “intersection\_related” variable in ALISS. The participants agreed that this definition can be the common definition unanimously.

Larry Talley and Margaret Bonne-Pixley discussed the fact that the crash analysis is the engineer’s job and the police officers should not be burdened with collecting data or making judgments that are more suited for crash analysis than the data that they have been collecting till now. Sarath pointed out that ADOT is revising the Arizona Traffic Accident Report form and this may be an opportunity to recommend changes to the form by the group.

Lt. Mike Lockhart of DPS pointed out that the distance from the nearest intersection and the type of location (i.e. intersection, junction, alley, etc.) are recorded already and asking the police officer to indicate whether the crash is related to the intersection may be redundant. Chris Plumb from MCDOT agreed that “intersection related” needs to be defined better for the investigating officers to make consistent judgments. Lt. Lockhart cited Title 28 and said that the definitions in Title 28 are the ones that the police officer can follow and be able to defend in a courtroom.

Jim Lee concluded the discussion on “intersection related” by noting that the participants unanimously agreed that MAG can use “intersection\_related” variable in ALISS for identifying intersection-related crashes given the fact that ADOT determines whether the crashes are intersection-related or not based on the accident description and that it is expected that a fewer set of crash data entry technicians (i.e. less than ten) will be consistent enough.

Jim Lee moved the discussion to “left turn” crashes and presented two options for a common definition. Nancy Ann Crandall questioned the definition of “left turn” crashes presented to be used by ADOT. The source of the definition was traced back to the instruction manual of ADOT. She agreed that the definition in the Instruction Manual might indicate that any crash involving one or more left-turn vehicles should be classified as “left turn” crashes. But, she conveyed that ADOT has been defining the left-turn crashes as crashes between a left-turning vehicle and another vehicle traveling in the opposing direction to the leg from where the left-turn vehicle is making a left-turn.

The group agreed to use the definition that has been in use by ADOT as the common definition for MAG analyses.

Chris Plumb asked what the default value for the age was. Nancy Ann Crandall and Kiran Guntupalli of MAG mentioned that 255 is used when left blank. He also asked whether ALISS has the x, y coordinates. It was informed that the lat, long has been added to ALISS. Larry Talley asked if latitude and longitude had been defined – i.e. Center point of the intersection, location of first harmful event, final resting place of Unit 1 or where? Chris from MCDOT offered to provide ADOT with maps of city limits updated on a daily-basis.

#### Draft Table of Common Definitions:

Jim Lee summarized the common definitions agreed upon at the workshop. They were that the intersection-related crashes would be identified using the “intersection related” variable in ALISS and that the left-turn crashes would be defined as the crashes involving a left-turn vehicle and another vehicle traveling in the opposing direction (i.e. the direction opposing to the direction of the leg from which the left turn vehicle is turning).

#### Conclusion:

Sarath Joshua advised the participants that the draft notes from the workshop would be emailed to attendees and stakeholders for comments before being finalized.

## Appendix F: Table of Common Definitions

The following is a list of definitions agreed upon at the workshop. It includes resolution of identified differences in the definitions used by member agencies and definitions that were adopted from the 7<sup>th</sup> Edition of “Manual of Instructions for use with State of Arizona Traffic Accident Report Forms” published by Arizona Department of Transportation dated December 2000. This Table of Common Definitions to be used by MAG and its member agencies should be continually updated as changes are adopted by ADOT. The definitions that were discussed and specifically agreed upon at the workshop and the updated definition for pedestrian conveyances based on Article 28-908 of Arizona Traffic Law Manual are in italicized and bold format.

### 1. Definition of a Motor Vehicle Traffic Accident:

If an incident occurs involving a motor vehicle, a determination must be made as to the classification of the event. Read the following criteria and if the response is “yes” to the first seven questions, (or eight if a railroad train is involved), then the incident should be classified as a reportable motor vehicle traffic accident.

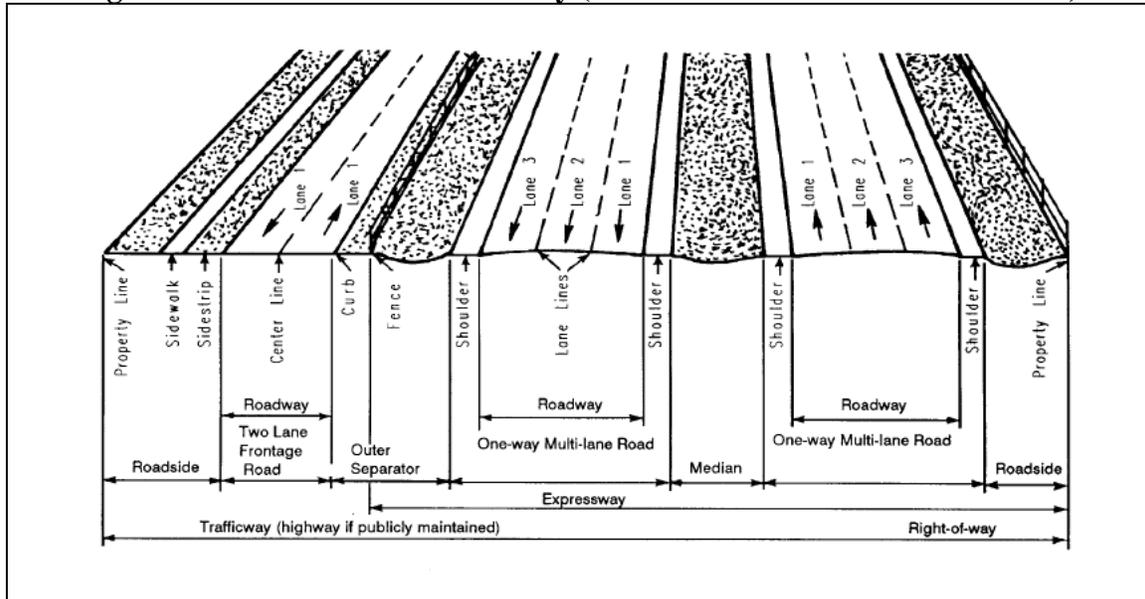
1. Did the incident include one or more occurrences of injury, death, or damage?
2. Was there at least one occurrence of injury, death, or damage that was not a direct result of natural disaster?
3. Was there bodily injury, death, or damage to the property of any one person in excess of one thousand dollars? (See Arizona Revised Statute 28-667)
4. Did the incident involve one or more motor vehicles?
5. Of the motor vehicles involved, was at least one in transport?
6. Was the incident an unstabilized situation?
7. Did the unstabilized situation originate on a trafficway or did injury or damage occur on a trafficway?
8. If a motor vehicle in transport collided with a railroad train, did the collision occur at or near a railroad crossing?

Definitions of the terminology used in this checklist are included in the following definitions.

### 2. Trafficway:

Any land way open to the public as a matter of right or custom for moving persons or property from one place to another. Trafficway is depicted in Figure 2.

**Figure 2. Illustration of Traffic Way (Source: ADOT Instruction Manual)**



### 3. Unstabilized Situation:

A set of events not under human-control that originates when control is lost and terminates when control is regained, or when all persons and property are at rest.

### 4. Private Property Accidents:

Accidents where the unstabilized situation, damage, injury, or death do not originate nor occur on a trafficway. Private Property accidents include: accidents in parking stalls, driveways, or other areas away from roadways and highways such as deserts, farm land, etc.

### 5. Traffic Unit:

Traffic units include all of the following involved in a crash.

1. Motor vehicles - automobiles, trucks, vans, motorcycles, motor homes, mopeds, buses, taxis, ambulances, police vehicles, fire trucks, golf carts, etc. it may also include electrically powered vehicles.
2. Pedestrians - people on foot or on human powered non-motorized devices such as: skateboards, roller skates, baby carriages, etc.
3. Pedalcyclists - people on non-motorized devices propelled by pedaling such as: bicycles, tricycles, unicycles, pedalcars, etc.
4. Animal and rider - person on a horse, mule, etc. or sitting in a cart drawn by an animal or team of animals.

5. Construction, farm, or industrial - machinery while in transport upon a trafficway for the purpose of moving people, the device itself, or property from one place to another.

## 6. Injury Classifications / Severity:

All of the following injuries, except death, should be classified on the basis of conditions known at the time that the Arizona Traffic Accident Report Form is prepared. If information is received that an injury produced death within 30 days from the date of the accident an amended report should be issued by the investigating agency changing the injury classification accordingly.

1. No injury - a situation where there is no reason to believe that the person received any bodily harm from the motor vehicle traffic accident in which they were involved.
2. Possible Injury - Any injury reported or claimed which is not a fatal, incapacitating, or non-incapacitating evident injury. This includes such situations as nausea, hysteria, complaint of pain, and injuries not evident.
3. Non-Incapacitating Evident - Any injury other than fatal and incapacitating which is evident to any observer at the scene of the accident. Injuries include bumps, abrasions, bruises and minor lacerations. The person receiving these injuries is still able to leave the scene under their own power.
4. Incapacitating – This is an injury, other than a fatal, which prevents the injured person from walking, driving or normally continuing the activities which he was capable of performing prior to the motor vehicle traffic accident. This includes severe lacerations, broken or distorted limbs, unconsciousness, inability to leave accident scene without assistance.
5. Fatal – Accident involving one or more fatalities at the time of investigation and to be updated if information about fatalities resulting from the accident within 30 days of the occurrence of the accident.
6. Unknown - Primarily used for people who have left the scene of the accident prior to police arrival such as hit and run situations.

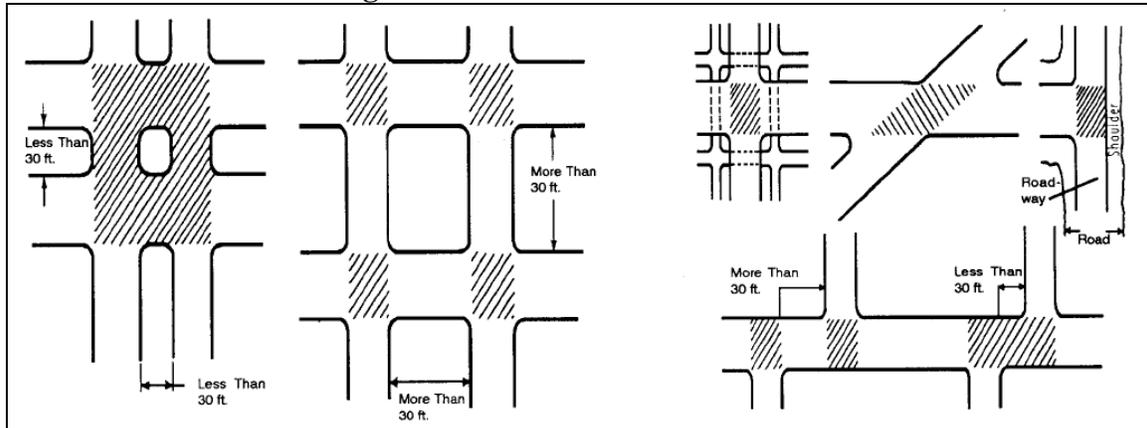
## 7. First Harmful Event:

First harmful event is the first occurrence of damage, injury, or death in the series of events that constitute a motor vehicle traffic accident.

## 8. Intersection:

When two or more roadways cross or connect, the area contained within the extension of curb lines, or, if none then the lateral roadway boundary lines is defined as the intersection. Driveway accesses are not classified as intersections. When the distance along a roadway between two areas meeting the criteria of an intersection is less than 30 feet, the two areas and the roadway connecting them are considered to be parts of a single intersection. If the two areas as described above are more than 30 feet apart, then the areas are considered to be separate intersections. The shaded areas in Figure 3 represent the boundaries of intersections.

**Figure 3. Illustration of Intersection**



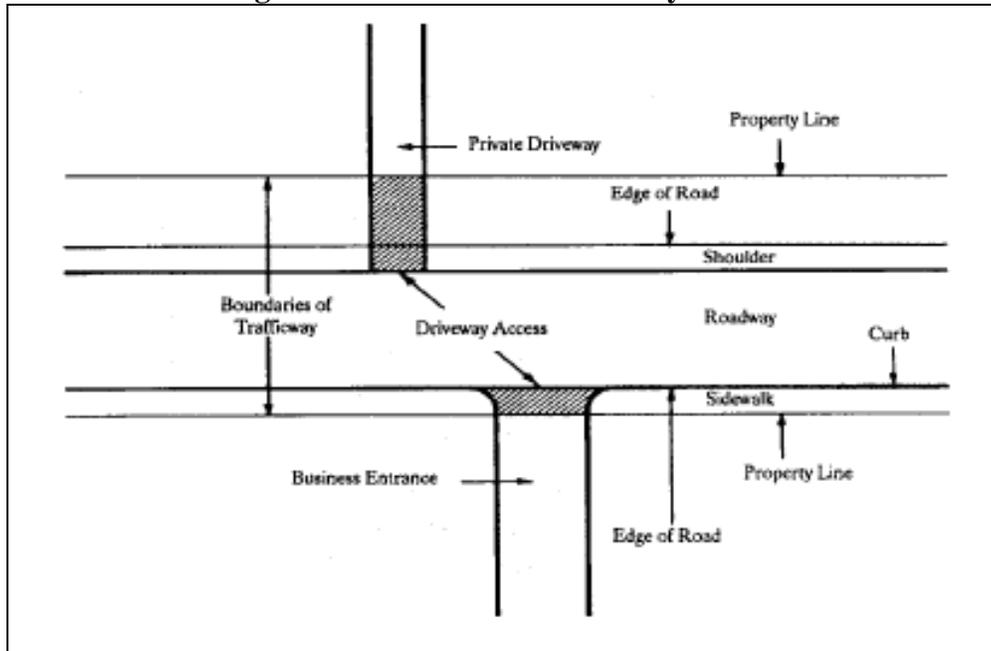
### 9. Alleys:

An unnamed road, usually narrow, through the middle of a block giving access to the rear of buildings. Accidents occurring in an alleyway are considered reportable accidents and should be reported. Accidents in alleys are recorded with the street intersected by the alley (“on street”) and the street that intersects the “on street” (“intersecting street”) on either side of the alley.

### 10. Driveway Access:

A roadway by which motor vehicles may enter or leave a trafficway and limited to the portion that is entirely within the confines of the trafficway, Includes driveways and entrances to and exits from property adjacent to the trafficway. Driveway Access is illustrated in Figure 4.

**Figure 4. Illustration of Driveway Access**

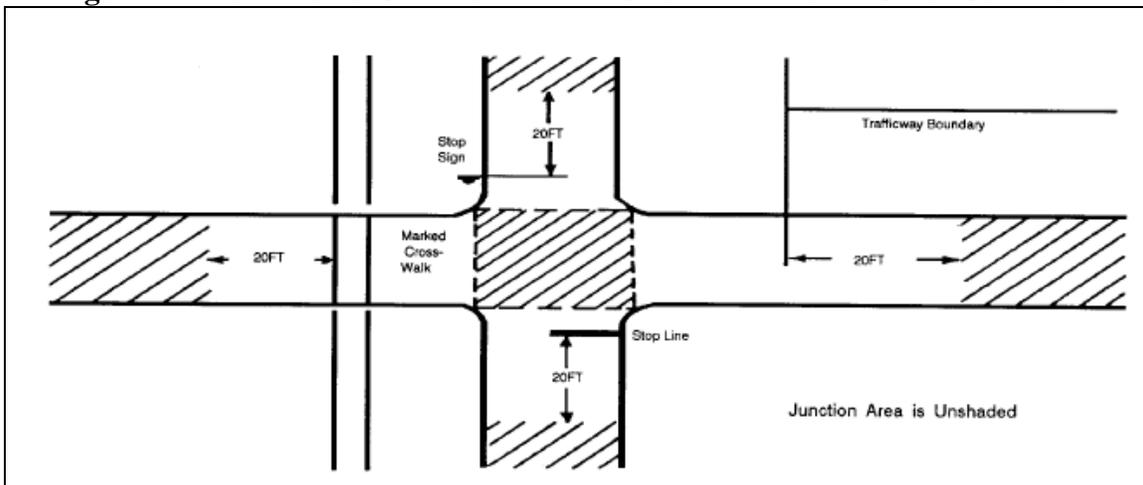


**11. Junction Area:**

The area in the vicinity of the intersection of two or more roadways is defined as Junction Area as below.

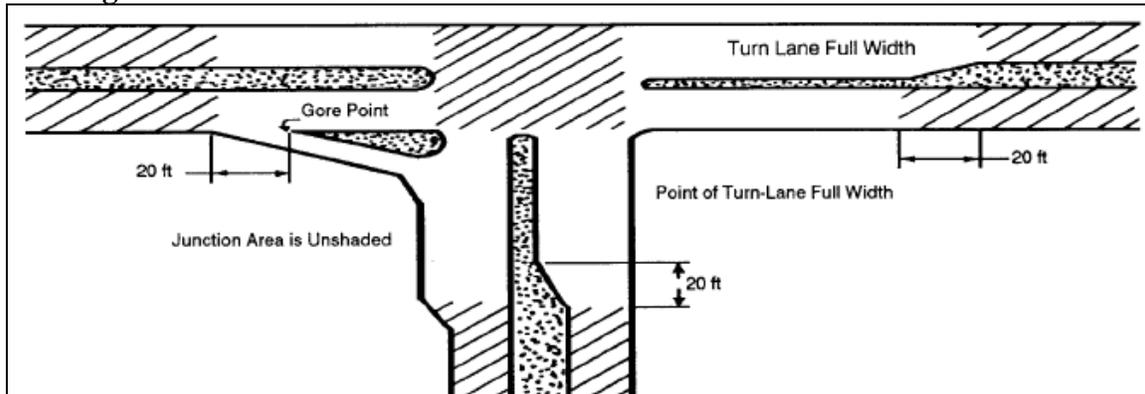
- A. At unchannelized at-grade junctions, the junction area is within twenty (20) feet beyond the crosswalk (whether marked or unmarked), a stop-line marking, a stop sign or yield sign, whichever is farthest from the intersection. Whenever these limits are not present, projections of the boundaries of the trafficway can be used. The unshaded area in Figure 5 shows the junction area around an at-grade intersection.

**Figure 5. Illustration of Junction Area at Unchannelized At-Grade Junctions**



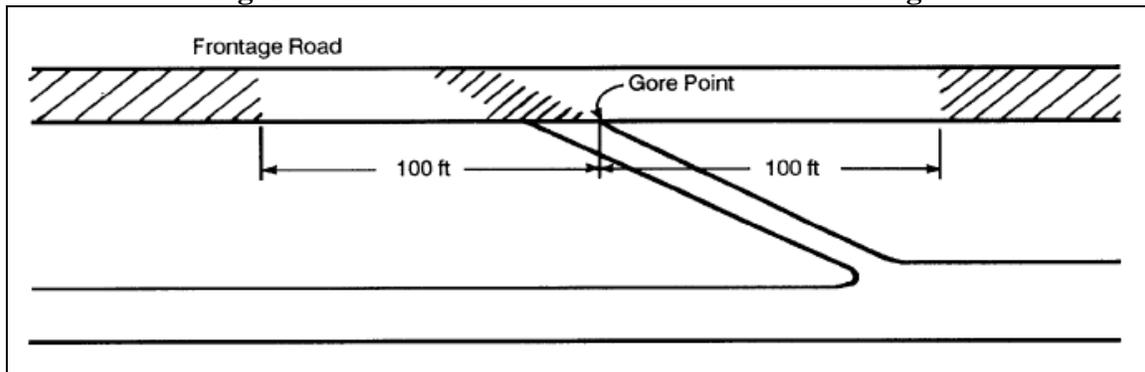
- B. At channelized junctions, the junction area is within twenty (20) feet beyond the gore of islands, or the point at which the turn lane attains full width. Disregard advance warning signs in determining limits of junction area. Unshaded area in Figure 6 shows the junction area with respect to channelized at-grade junctions.

**Figure 6. Illustration of Junction Area at Channelized At-Grade Junctions**



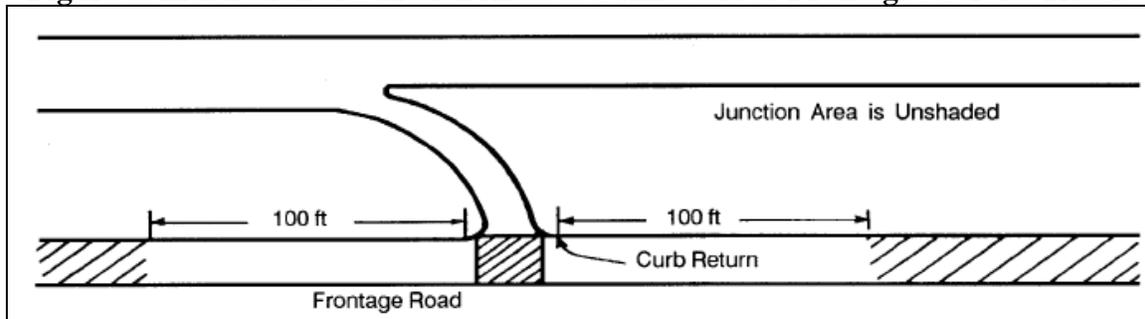
- C. At an interchange, the junction area is within 100 feet beyond the farthest gore or curb return of the turning roads in each direction. Do not consider painted or reflectorized separation or barrier lines as gores for this purpose. Figure 7 shows the junction area with respect to interchanges with frontage roads (i.e., Junction area is unshaded).

**Figure 7. Illustration of Junction Area at Interchanges**



- D. At connectors to frontage or service roads, the junction area includes the connector and parts of the frontage or service road within one hundred (100) feet in either direction of the gore or curb return and between the connector and service or frontage road. The unshaded area in Figure 8 near connectors to a frontage road is the junction area.

**Figure 8. Illustration of Junction Area at Connectors to Frontage / Service Roads**



#### **12. Distance:**

Distance is either measured or approximated from the apparent center line of the intersecting street to the point of the first harmful event.

#### **13. Date of Birth:**

Date of Birth by month, day, and year. If only age is known, default Date of Birth is January 1, of appropriate year.

#### **14. Gross Weight:**

The total weight of the vehicle including the vehicle itself, the load (persons and property), and all added equipment.

#### **15. Manner of Collision:**

This is the type of crash that causes the damage. Most of the choices are self-explanatory but some basic guidelines follow. Vehicle action also gives a clue to manner.

1. Single Vehicle – Crashes involving just one motor vehicle as defined earlier (usually ran off road, fixed object, or overturning).
2. Angle – Crashes involving more than one motor vehicle traveling on roadways that intersect each other (also called T-bone crash).
3. Left Turn- *Crashes involving a left-turning motor vehicle and another motor vehicle traveling in opposing direction. Some may appear to be angle or head on.*
4. Right Turn- Crashes involving two or more motor vehicles of which one or more motor vehicles are making a right turn.
5. U Turn- Crashes involving two or more motor vehicles of which one or more motor vehicles are attempting to make a U-turn at the intersection.
6. Rear-End- Crashes involving two or more motor vehicles traveling in the same direction in the same travel lane.
7. Head-On- Crashes involving two or more motor vehicles that are traveling in opposite directions. Contact does not necessarily have to be front to front and the motor vehicles are typically not making turns during the time of crash.

8. Sideswipe-Same Direction – Crashes involving two or more motor vehicles traveling in the same direction typically in adjoining travel lanes. Examples include crashes involving motor vehicles making a passing movement or motor vehicles drifting in the travel lane.
9. Sideswipe-Opposite Direction- Crashes involving two or more motor vehicles traveling in the same direction typically in adjoining travel lanes. Examples include crashes involving motor vehicles making a passing movement or motor vehicles drifting in the travel lane. These crashes do not change direction of momentum of the motor vehicle and less than 4 inches of contact occurs.
10. Backing- Crashes involving one or more motor vehicles backing out of a driveway and another traffic unit (i.e., motor vehicles, pedestrians, pedalcycles).
11. Non-Contact Motorcycle- Crashes involving only a motorcycle and no other traffic unit. Examples would include motorcycle riders lying down to avoid a crash or sliding.
12. Non-Contact Non-Motorcycle- Crashes involving a motor vehicle other than motorcycles and do not involve any contact between the motor vehicle and property or other traffic units. Example includes vehicle breakage or fire.
13. Pedestrian- Crashes that involve one or more pedestrians.
14. Pedalcycle- Crashes that involve one or more pedal cyclists.
15. Other- None of the above.

#### **16. Intersection Related:**

*A traffic accident where the first harmful event (1) occurs on an approach to, movement through or exit from an intersection and (2) has resulted from an activity, behavior, or control related to the intersection.*

#### **17. Special Location:**

The following definitions for special locations are provided in the Manual.

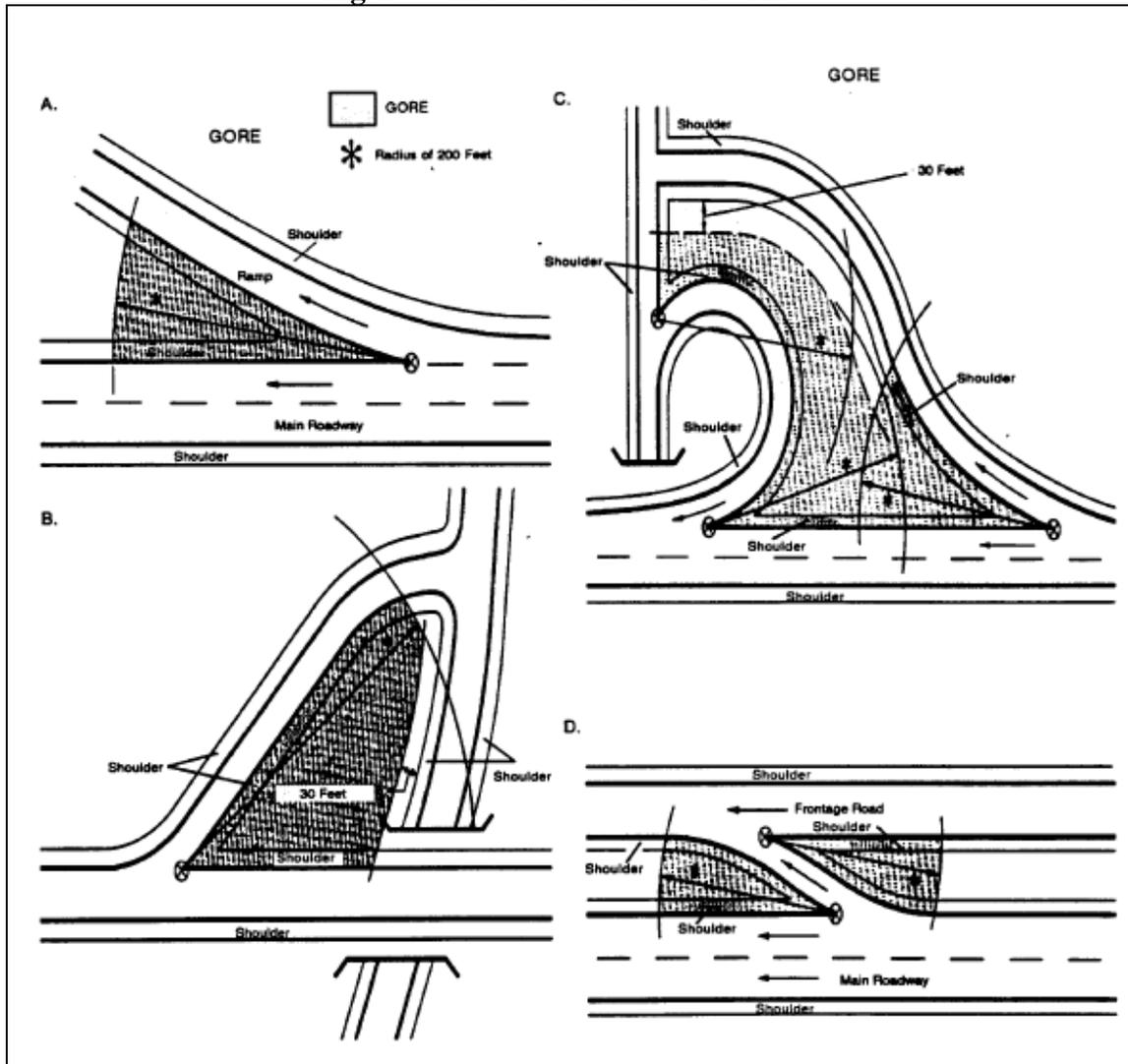
1. School Crossing - A specially signed area preceding and including the crosswalk where speed is reduced. This box should be used only while school is in session or a school related function is in progress
2. Pedestrian Crosswalk (striped) - The area within the striped boundaries of the crosswalk.
3. Pedestrian Crosswalk (not striped) - Areas where pedestrians may legally cross the roadway adjacent to the intersection area.
4. Bridge - Includes the road on the bridge structure and the approaches to the bridge if the road width changes.
5. Tunnel - Includes the road within the tunnel and the approaches to the tunnel if the road width changes. Railroad or roadway underpasses are not considered tunnels.
6. Railroad Crossing - where the railroad right-of-way and the trafficway overlap. The trafficway must be at the same grade as the railroad and not an overpass or underpass.

7. Gore – An area of the trafficway where two roadways diverge or converge, and is bounded on at least two sides by the edges of those roadways. (See page 73 for more detail and diagrams.)
8. Bike Path - A place reserved for bicycle travel and marked either by signs, painted markings, or physical barriers or a combination thereof.
9. Two-way Left Turn Lane - Where there is a commonly used lane only for left turns by traffic traveling in opposing directions.

### 18. Gore:

An area of land where two roadways diverge or converge, and is bounded on two sides by the edges of the roadways which join at the point of divergence or convergence. The direction of traffic should be the same on both sides of these roadways. The area includes shoulders or marked pavement, if any, between the roadways with the third side being 200 feet from the point of divergence or convergence, or if any other road is within 230 feet of that point, a line 30 feet from the nearest edge of such road (see Figure 9).

**Figure 9. Illustration of “Gore” Area**



## 19. Unusual Road Condition:

The following eleven unusual road conditions are defined in the Manual.

1. Under Construction Traffic Allowed – Area of roadway under construction marked with appropriate construction zone signing with motor vehicle traffic permitted to travel through the construction zone either continuously or intermittently by flag person or a pilot car.
2. Under Construction No Traffic Allowed – Area of roadway under construction that is closed to through traffic by barricades or other traffic controls. The accident must occur within the closed construction zone.
3. Under Repairs – Area where roadway and/or utilities in the roadway are undergoing maintenance or repair. The repair zone is usually identified by temporary signs and channeling devices, such as cones which are generally in place for a short time such as a few hours or a few days.
4. Holes, Ruts, Bumps – Area of roadway surface in need of immediate repair due to pot holes, pavement upheaval, or cracking. It does not include roadway surfaces worn down by normal wear and tear.
5. Obstruction Protected – Obstacles on the roadside (such as bridge supports, poles, sign posts, gore areas) that are protected by impact attenuator devices such as crash cushions, guard rails, barriers etc.
6. Obstruction Unprotected – Obstacles on the roadside (such as bridge support, poles, signs posts, gore areas) that are not protected by impact attenuator devices such as crash cushions, guard rails, or barriers.
7. Obstruction – Unlighted at Night – This item is currently not in use.
8. Irregular Shoulders – The shoulder portion of the roadway that is either not maintained or is signed with "low shoulder" or "soft shoulder" signs.
9. Changing Road Width – The pavement width is tapered either for the addition or deletion of a traffic lane or a turn lane. This does not include a tapering in the width of a traffic lane where no lanes are added or deleted.
10. Water (Standing or Moving) – Water on a roadway backed up from a curb, drainage area, or wash and sufficient enough to result in vehicle control problems, and is other than wet surface from rain.
11. Temporary Lane Closure – When a lane of a multiple lane roadway is closed to traffic by using cones, barricades, etc. This category is not intended for two lanes, two way roadways where traffic control is handled by flag person or a pilot car.

## 20. Non-Intersection Road Character:

Non-Intersection road characters are defined in the Manual as followed.

1. Two-way striped center line – Traffic traveling in opposite directions is separated by double solid lines where passing is prohibited in both directions, a double line consisting of a broken and a solid line where passing is permitted in one direction,

- or one broken line where passing is permitted in both directions. The lines may be formed with paint, raised pavement markings, or both.
2. Two-way no stripe – Either an unpaved roadway or a paved roadway with no travel lanes designated by paint or other pavement markings.
  3. Two-way painted median – An area flush with the pavement and outlined with paint, raised pavement markings, or both. Includes a two way left turn lane and may include diagonal stripes for better definition.
  4. Two-way raised median – The median consists of a paved or landscaped island higher than the adjacent roadway surface. The boundary between the median and the road may or may not have a curb.
  5. Two-way concrete barrier median – A concrete barrier of any kind designed specifically to prevent traffic from entering the opposing lanes. Sometimes called a “jersey barrier”.
  6. Two-way Cable Barrier – A wire cable barrier periodically anchored in the ground and Designated to prevent or deter a vehicle from entering the opposing lane.
  7. Two-way depressed median – The opposing traffic roadway surfaces are separated by a constructed depression, usually shallow, and wide enough to impede traffic from intentionally crossing the median.
  8. Two-way extended median – The opposing traffic roadway surfaces are separated by natural geographic features such as hills, mountains, gorges, etc. The width is greater than what a normally designed median would be.
  9. One-way street – There are no opposing roadway surfaces. All traffic moves in the same direction.

## **21. Physical Conditions Influencing Driver:**

1. No apparent influences – The appearance and behavior of the person reveals no apparent influences.
2. Had been drinking – The investigator has reason to believe the person had been drinking and alcohol. The person does not need to meet ARS 28-1381 criteria.
3. Use of illicit drugs – The investigator has reason to believe that drugs or narcotics have influenced the person’s actions.
4. Illness – Physical and/or mental impairment other than bodily defects or infirmities.
5. Sleep/Fatigued – When the officer believes from his investigation that the person was sleepy or fatigued. This determination can be made from driver statements, manner in which vehicle left roadway, etc.
6. Physical Impairment – Any temporary or permanent disability. Describe specific defect in accident narrative.
7. Prescription Drugs – Those prescribed by medical personnel.
8. Other – An influencing factor not included above. Describe in narrative.
9. Unknown – This classification should be selected if the investigator is unable to make a valid determination without further information.

## **22. Direction of Travel:**

The direction indicated should be the compass direction just prior to the onset of the unstabilized situation. Pedestrians, pedalcyclists, or animal rider's direction of travel should also be included.

## **Other Relevant Definitions:**

### **23. Axle:**

A supporting shaft or rod on which a vehicle's wheels revolve. Number of shafts on a commercial vehicle (truck) can vary due to the length of the vehicle.

### **24. Channelized Intersection:**

An at-grade intersection in which traffic is diverted into definite paths by raised or painted traffic islands.

### **25. Crosswalk:**

That part of a roadway at an intersection included within the connections of the lateral lines of the sidewalks on opposite sides of the roadway, measured from the curbs, or in the absence of curbs, from the edge of the traversable roadway. Any portion of a roadway at an intersection or elsewhere distinctly indicated for pedestrian crossing by lines or other markings on the surface.

### **26. Damage:**

Any harm to property that reduces the monetary value of that property.

### **27. Driver:**

Is an occupant of a transport vehicle who is in actual physical control of that vehicle, or for an out of control vehicle, an occupant who was in control prior to losing control.

### **28. Frontage Road (Access Road):**

A road contiguous to and generally paralleling (access road) an expressway, freeway, parkway, or through street to intercept, collect and distribute traffic desiring to cross, enter, or leave such facility and to furnish access to property which would be otherwise isolated as a result of controlled-access features.

### **29. In Transport:**

"In Transport" means in motion or on a roadway when applied to motor vehicles. In transport includes: motor vehicle in traffic or on a highway, driverless motor vehicle in

motion, motionless motor vehicle abandoned on a roadway and disabled motor vehicles on a roadway. On roadway lanes used for travel during rush hours, and parking during off peak hours, a parked motor vehicle is in transport during periods when parking is forbidden.

**30. Median:**

A paved, raised, or landscaped center dividing area separating directions of a roadway.

**31. Milepost:**

A reference marker located along side a highway indicating a specific location point.

**32. Motor Vehicle:**

Any mechanically or electrically powered device, not operated on rails, upon which, or by which any person or property may be transported upon a roadway.

**33. Non-Collision Accident:**

A motor vehicle traffic accident that does not involve a collision, but does include accidents such as overturning, jackknifing, carbon monoxide, vehicle breakage, explosion, fire, toxic chemical leakage, falling or jumping from a vehicle, object falling from, on, in, or thrown against a vehicle, etc.

**34. Off Mainline:**

Consists of on-ramps, off-ramps, frontage roads, access roads, etc. that are connected with controlled or limited access routes as well as rest areas, ports of entry, crossroads, and connector roads.

**35. Pedalcycle:**

Non-motorized vehicle operated by pedals and propelled by human power. Pedalcycles include bicycles, tricycles, unicycles, pedal cars, etc.

**36. Pedestrian:**

Any person who is not an occupant or driver of a motor vehicle or other road vehicle is a pedestrian. Pedestrians include person walking, sitting, lying, working, or operating a pedestrian conveyance.

**37. Pedestrian Conveyance:**

Human powered device, other than pedaling, by which a pedestrian may move himself or other pedestrians. Conveyances include but non limited to: baby carriage, child's wagon,

roller skates, sleds, push carts, *motorized* and non-motorized wheel chairs, *scooters for the handicapped*, *segways*, scooters, skateboards, etc.

### **38. Private Property Accidents:**

Accidents where the unstabilized situation, damage, injury, or death do not originate nor occur on a trafficway are Private Property accidents. Private Property accidents include: accidents in parking stalls, driveways, or other areas away from roadways and highways such as deserts, farm land, etc.

### **39. Ramp:**

Ramp is any inclined roadway connector carrying motor vehicle traffic to and from different levels of roadway.

### **40. Road:**

Road is the part of a trafficway which includes the roadway and the shoulder alongside the roadway.

### **41. Safety Device / Restraint Usage:**

- 1 – This code is used if no safety device was used even though the vehicle may be equipped with restraints.
- 2-9 – These codes are used if a safety device was used at the time of the accident.
- 4 – Airbag deployed. This code should be used along with any other relevant device.
- 0 – This code should be used only if the investigating officer is unable to determine if a restraint was or was not used.

### **42. Seat Position:**

- 01 – Designates driver's position
- 02 – Front passenger position between driver and right front passenger. Also used for right side driver/steering vehicles (US Postal Service, Foreign registry, British, etc).
- 03 – Right front passenger position.
- 04 – Left rear passenger position. (Left center for station wagons or vans.)
- 05 – Rear passenger position between left rear and right rear. (Center position for station wagons and vans.)
- 06 – Right rear passenger position. (Right center for station wagons and vans.)
- 07 – Left rear passenger position for station wagons and vans.
- 08 – Center passenger position for station wagons and vans.
- 09 – Right rear passenger position for station wagons and vans.
- 10 – Passenger not in a normal passenger compartment. (Riding in the bed of a truck, inside camper, etc.)

- 11 – Passengers on a motorcycle or in a bus.
- 12 – Persons riding on construction, farm, or industrial machinery, etc.

### **43. Shoulder:**

Shoulder is that portion of the road contiguous to 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 curb, or a change of surface color or material. 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.