

HOURS: 16

TOPIC: TRAFFIC ACCIDENT MANAGEMENT, RESPONSE, & REPORTING

DESIRED OUTCOME FOR THIS CLASS

Provide trainees with the knowledge and skills to properly respond, secure, manage, and preliminary investigate a traffic accident – to include writing a crash report using TraCS.

TRAINING OBJECTIVES:

1. Explain the process for responding to and conducting a preliminary investigation of a traffic accident.
2. Identify the physical facts of vehicles and roads and their impact on vehicle accidents.
3. Explain how to detect, respond to, and remove traffic incidents and restore traffic capacity as safely and quickly as possible, using the Traffic Incident Management (TIMs) process. (Objective not evaluated)
4. Accurately complete a traffic accident report using TraCS. (Performance only – informally evaluated during class)

CRITERIA: Trainees will be tested on the following:

1. Accident scene safety & responsibilities of investigator
2. The traffic accident (crash) process
3. Classification of crash terms
4. Crash types
5. Reportable crashes
6. Terminology & Definitions associated with crashes
7. Human elements (factors) associated with crashes
8. Interviews during accident investigation
9. Evidence associated with crashes
10. Photographing crash scenes
11. Physical facts from roadways
12. Physical facts from vehicles

EVALUATION:

1. Training objectives 1 and 2 for this topic will be tested via and end of phase written examination. The minimum passing score for the examination is 70%.
2. Training objective 3 is not evaluated. A certificate of completion will be issued at the end of the training session.
3. Training objective 4 will be informally evaluated in class.

INSTRUCTOR NOTE: *This course is broken into three separate learning modules:*

- *Module One – Traffic Accident Reporting “TraCS” (4 hours)*
- *Module Two – Traffic Management “TIMS” (4 hours)*
- *Module Three – Traffic Accident Response (8 hours)*

MODULE ONE: Traffic Accident Reporting (TRACS) HOURS: 4

INSTRUCTOR & STUDENT NOTE: For Module One refer to the TraCS Student Manual and the TraCS Student SD Accident Reporting Manual

STUDENT NOTE: This module is NOT testable. The below information is an outline of material presented during this 4 hour block. This module will be hands-on and interactive. **Module 3 is testable, so ensure you scroll down.**

MODULE TWO: Traffic Incident Management System HOURS: 4

STUDENT NOTE: This module is NOT testable. You will be given a student handbook at the beginning of this class. At the end of the 4-hour block, you will be issued a certificate of completion. **Module 3 is testable, so ensure you scroll down.**



National Traffic Incident Management Responder Training Program

4-HOUR COURSE STUDENT HANDOUT



U.S. Department of Transportation
Federal Highway Administration

SHRP2 SOLUTIONS
STRATEGIC HIGHWAY RESEARCH PROGRAM



Name _____ Organization _____

Location _____ Date _____

Last Updated: 01-06-2014

I. Scene Safety and Responsibilities**A. First Response Considerations:**

1. Location
2. Types of injuries
 - a. Minor
 - b. Life-threatening
 - c. Fatal
3. Are there any other emergency personnel responding?
4. Is the road blocked?
5. What are the weather considerations?

B. Proceed quickly, but SAFELY**C. Do not depend on emergency equipment****D. Emergency Vehicle Operators****SDCL 32-26-15**

- Yielding right-of-way to emergency vehicles
- Duty of driver of emergency vehicle not to exercise right-of-way arbitrarily
- A violation of this section is a Class 2 misdemeanor

E. Remember, if you get into a traffic crash while responding... you become an additional problem, not the solution to the existing problem.**F. Preservation of Evidence**

1. Impoundment of vehicle – contact states attorney
2. Preservation of forensic evidence -- throwing/tossing stuff into cars ruins any evidence that was there previously
3. Maintain your chain of custody
4. Control access to vehicle
5. Change mindset from traffic crash to criminal elements

- 6. Control the Scene! -- Treat as any other crime scene
- G. ALWAYS be officer safety conscious and be very careful. Ask yourself who is #1 and who is looking out for you.

II. Traffic Crash Process

- A. Traffic Crash (Definition) -- *That occurrence in a sequence of events which usually produces unintended injury, death or property damage.* SOURCE: U.S. National Safety Council
- B. If it is intentional Act, it may not be a reportable traffic crash.
- C. Traffic Crash Investigation (Definition) -- *The thorough examination of all elements contributing to the crash, resulting in a well-founded explanation of the series of events which occurred based upon factual data.* SOURCE: Highway Safety Division of the *International Association of Chiefs of Police*
- D. The primary purpose of traffic crash investigation is to inquire into, or examine with systematic detail, the various causes of the crash
 - 1. Set up an individual plan to conduct the investigation methodically and thoroughly.
- E. ***The objective of any investigation is to find the truth***
- F. Make sound judgments
- G. Keep an open mind and re-evaluate facts as the investigation progresses (No two crashes are the same.)
- H. Place emphasis on gathering and recording facts
- I. Do not depend upon inferences or possibilities
- J. Investigation of a crash starts when you first arrive on scene
- K. Objectives of Traffic Crash Investigation
 - WHO – was involved?
 - WHAT – happened?
 - WHY – did it happen?
 - WHEN – did it happen?
 - WHERE – did it happen?
 - HOW – did it happen?

L. Duties of the Traffic Crash Investigator

1. Care for the injured (within scope)
2. Protect property and person from further injury / damage / loss
3. Gather evidence
4. Identify and interview drivers, victims, and other witnesses
 - a. Digital vs. Written Statements
5. Verify vehicle information
6. Verify vehicle insurance
7. Conduct inspection of the vehicles
8. Record the facts
 - Make notes
 - Take statements
 - Scene measurements
 - Photograph the physical evidence

M. As a Traffic Crash Investigator you should:

1. Work to develop a particular aptitude for this type of investigative work
2. Have a good basic knowledge of crash causation and a general knowledge of crash reconstruction principles
3. Further your expertise and competency by taking additional training
4. Traffic Crash Process

N. Your investigation may reveal:

1. The crash may have been staged to defraud an insurance company or cover up some other crime (suicide or homicide)
2. Avoid forming biased opinions either prior to or during the investigation

O. Drivers and Witnesses

1. Locate and identify drivers and witnesses
2. Make notes on all other vehicles, including their license numbers that are at or near the scene
3. When contacting bystanders to inquire whether they are witnesses, be courteous and tactful
4. Witness information may be:
 - Prejudiced or biased
 - A friend or relative of one of the persons involved
 - A person who is trying to gain the attention the investigator
5. Be careful not to guide witnesses while answering questions
6. Determine where the witness was and exactly what they saw, heard, felt or smelled
7. Contributing Factors of the Crash
 - a. Did driver fail to adjust to the roadway condition
 - b. Did driver failed to adjust to the traffic conditions
 - c. Mechanical failure of the vehicle (brakes, steering, etc...)
 - d. The driver will often offer another explanation of the cause.
 - e. They will minimize their role and attempt to fault something or someone else:

P. Three elements that break down to cause a traffic crash

- Environmental
 - Vehicle
 - Driver
1. Elimination of elements
 - a. There is not always a single cause of traffic crash
 - b. Eliminate the elements and factors, and you will identify the cause

- c. It is your job as an investigator to figure out what broke down and led to the crash

Q. Enforcement

1. Proper enforcement action is one of the most important aspects of promoting traffic safety
2. Enforcement helps to prevent traffic crashes
3. Enforcement is taken when violations are in connection to the actual crash or as a result of a violation that could be a cause or a contributing factor in a crash

R. Follow-up Investigation

1. In many cases, the investigation cannot be completed at the scene
2. Follow-up on the nature of injuries at the hospital
3. Take additional statements as needed
4. Take necessary action to complete the investigation in a thorough and professional manner
5. Even if the crash is minor, the same process must be taken to ensure a factual report of the events is taken.
6. Your findings can result in changes in legislation, driver training or changes in police services.

a. Examples of Changes

- 1). Changes may result in special enforcement programs, DUI enforcement.
- 2). Changes in road design, speed limit changes, or other roadway safety changes.
7. Keep your notes and work professional and thorough
8. Your work will be examined by Supervisors, other Officers, Attorneys, Dept. of Accident Records, Dept. of Transportation, Insurance companies and many other individuals.

III. Classification of Crash Terms

- A. Trafficway -- Any area open to the public for moving persons or property from one place to another.
- B. Highway -- The entire width between boundary lines of every way publicly maintained when any part is open to the use of the public for the purpose of vehicular travel. Also known as a publicly maintained street or highway.
- C. Road -- That part of a traffic way which includes both the roadway and any shoulder alongside the roadway including the curb.
- D. Roadway -- That part of a traffic way designed, improved, and ordinarily used for motor vehicle travel. Excluded are bicycle paths.
- E. Shoulder -- That part of a traffic way contiguous with the roadway for emergency use, for accommodations of stopping vehicles, and for lateral support of the roadway structure.
- F. Intersection -- An area that contains a crossing or connection of two or more roadways not classified as driveway access.
- G. Crosswalk -- Any portion of a roadway at an intersection or elsewhere distinctly indicated for pedestrian crossing by lines or other markings on the surface of the roadway, or extension of sidewalk boundaries, at an intersection, on opposite sides of the roadway measured from the curbs.
- H. Harmful Event -- An occurrence of injury or damage. This includes a complaint of injury no matter how slight.
- I. First Harmful Event -- Used to classify a traffic crash and sets the date, time, place and who is going to take charge in conducting the traffic crash investigation.
- J. Injury Classification
 - 1. Non-injury
 - 2. Possible injury
 - 3. Non-incapacitating
 - 4. Incapacitating injury
 - 5. Fatal

IV. Road Vehicle Crash Types

- A. Overturn -- First harmful event (FHE) is that the vehicle rolls over
- B. Collision -- First harmful event (FHE) is a collision (other than overturn) with another vehicle, property or pedestrian.
- C. Non-collision -- Anything other than a collision
 - 1. Overturn
 - 2. Accidental carbon monoxide poisoning - faulty exhaust
 - 3. Breaking of a vehicle part causing injury or property damage
Steering, tire failure, engine failure etc.
 - 4. Explosion of the vehicle
 - 5. Fire starting in the vehicle (excluding arson)
 - 6. Person falls or jumps from the vehicle

V. Reportable Vehicle Crash Types

- A. Occupant being hit by an object in the vehicle or thrown against some part of the vehicle.
- B. Injury or damage from a moving part of the vehicle (tire breaks off and hits another vehicle. Tire comes out from under trailer).
- C. Object falling on the road / vehicle.
- D. Toxic chemicals leaking from the vehicle.
- E. Injury or damage involving only the vehicle that is of a non-collision nature, such as driving into a flooded roadway without colliding or overturning or bridge collapsing as the vehicle drives over it.
 - 1. Exclusions
 - Being deliberately pushed from the vehicle (fighting).
 - An object being deliberately thrown at, into, or onto the vehicle

VI. Terminology and Definitions

- A. Traffic Crash Investigation

1. Reporting -- gathering basic data from vehicles, drivers, passengers, location, injuries and time of crash.
2. Investigation -- gathering information to support evidence of violations, interview persons involved, measure and record evidence from roadway and vehicles.
3. Reconstruction -- the determination on how the crash happened, determining the behavioral causes of the crash. This portion includes opinions, deductions and inferences.
4. Cause Analysis -- an attempt to determine why the crash happened based on the complete circumstances.

B. Traffic Crash Events

1. Pre-Crash -- the events that lead up to, but does not include, the driver's point of possible perception.
2. Crash -- the events that occur from the point of possible perception to final rest of the vehicles.

C. Pre-Crash Series of Events

1. Pre-Trip -- the events that occur, or the conditions that exist, relative to the driver and the vehicle, before the trip is started.
2. Trip -- the events that occur, or conditions that arise, after the trip starts and lead up to the point of possible perception.

D. Crash Series of Events

1. Point of Possible Perception -- the place and time at which a normal person could perceive a hazard.
2. Point of Perception -- the point where an object is comprehended, or perceived, as a hazard.

E. Perception/Reaction

1. Reaction -- the voluntary or involuntary response to a hazard or other situation that has been perceived.
2. Reaction Time -- the length of time from when a person perceives an object as a hazard to when he reacts to his perception.

3. Reaction Distance -- the distance traveled during the reaction time.

1. Determining Reaction Distance

- a. Formula: This formula is used to calculate the distance a vehicle travels at a constant speed.

$$D = (S \times 1.466) \times t$$

D = Distance traveled in feet (ft.) S = Speed of the vehicle in miles per hour (mph) t = Time in seconds (sec)
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4. Reflex Action -- involuntary action caused by a stimulus.
5. Simple Reaction -- response to an expected situation. The average time for a simple reaction is approximately 0.75 sec.
6. Complex Reaction -- response to an unexpected situation involving a decision. The average time for a complex reaction is approximately 1.6 sec.
- F. Encroachment -- entering or intruding into the rightful path or lane of another traffic unit.
- G. Point of Impact -- the place where a traffic unit strikes another traffic unit, object, or overturns.
- H. Primary Contact -- the first contact between two traffic units or a traffic unit and another object.
- I. Engagement -- the initial penetration of one traffic unit into another traffic unit, or object, during primary or secondary contact.
- J. Maximum Engagement -- the point of a traffic unit's maximum penetration into another traffic unit or object.
- K. Contact Damage -- the damage that results from the direct contact between two objects.
- L. Induced Damage -- the damage that is a direct result of the stress of the contact damage, crumpling of fenders.
- M. Superimposed Damage -- an area within the contact damage area which contains an imprint of an object. This is a direct result of contact between two objects.

- N. Separation -- the disengagement of traffic units, or disengagement of a traffic unit from an object after maximum engagement.
- O. Final Rest -- when vehicles, or other objects involved in the collision, have stabilized and no further damage or injury occurs.
- P. Secondary Contact
 - 1. A contact occurring when a traffic unit disengages from a primary contact and strikes the opposing traffic unit a second time, or strikes another traffic unit or object.
 - 2. What may be the secondary contact for one traffic unit may be the first or primary contact for another traffic unit.
- Q. Personal Injury -- bodily harm caused to a person during the Crash Series of Events.
- R. Fatal Injury -- an injury that causes death during the Crash Series of Events, or a personal injury sustained that directly results in the death of the injured person.

VII. Human Element

- A. Drivers and pedestrians are creatures of habit, therefore their behavior and routine at times can be predictable.
- B. A good investigation needs to consider the human element.
- C. Drivers emotions will range from calm to hysterical.
- D. They may be belligerent, offensive or even combative.
- E. Just like a crash, no two people are alike.
- F. REMEMBER: You have to deal with all of them!
- G. You must determine to what degree a person can drive or walk safely.
- H. You must determine what or if any human elements played a role in the crash.
 - Injuries
 - Fatigue
 - Impairment
 - General Health
 - o Vision

- o Hearing
- o Illnesses and Disease

I. You must determine what or if any human elements played a role in the crash.

- Carbon Monoxide Effects
- Physical Limitations
- Handicap (Physical and/or Mental)
- Reaction to External Stimuli
- Distractions

J. You must determine what or if any human elements played a role in the crash.

1. Temporary Impairment

- Drugs and Alcohol
- Attitude
- Knowledge and Skill
- Weather
- Distractions

2. Heart Condition

3. Epilepsy

4. Diabetes (At times similar to intoxication)

5. Personal Predispositions

- Aggressive Driver
- Straddling Lanes
- Impatience

6. Skills

- Manipulative Skill
- Recognizing Road Conditions
- Sharing the Roadway
- Maintaining Attentiveness

7. Natural Abilities

- Sensory Condition
- Mind and Nerves
- Bone and Muscle Conditions

8. Knowledge of Driving

- Care and Maintenance of Vehicle
- Knowledge of Vehicle Performance
- Ability to Avoid Hazards
- Understanding of Road Signs and Rules
- Practice of Defensive Driving

9. Pedestrian Elements

- Consider Age
 - Elderly is at greatest Risk
- Consider ability to judge speed
- Consider Intoxication Level of Pedestrian
- Consider Color of Clothing
- Consider if Pedestrian used reflective vest or flashlight
- Consider ambient lighting of area
- Did the pedestrian look before entering the road?
- Was the pedestrian's vision impaired?
- What was the pedestrian's attention on?
- Did the pedestrian believe the driver could see him?
- Did the pedestrian misjudge the vehicle's speed?

K. Driver and Pedestrian Condition

1. During our investigation, we need to look at areas where the human element breaks down.
2. Generally, the same personal factors that cause drivers to crash also cause pedestrians to be involved in crashes.
3. It is difficult to say that only the physical factor of a person was THE contributing factor to a crash.
4. There are three aspects with which we are primarily concerned.
 - a. Natural, mental and physical abilities
 - b. Learned abilities and knowledge which the person has acquired
 - c. Motives and attitudes which determine how and why a person thinks and feels about things
5. Keep in mind that driving is a learned trait.

6. A good driver with years of experience can overcome a hazardous situation, while a young driver with little or no experience may not.
7. You will encounter aggressive types who drive in the same manner.
8. An individual's personality may be affected temporarily.
9. Common factors include; alcohol, fatigue, medication and illness.
10. Ask yourself, "Would this crash have occurred if this condition had NOT been present?"
11. If you suspect physical or mental factors with a driver, you may need to consult with a doctor to determine if the factor played a part in the crash.
12. You may have a problem with patient/doctor privilege, but you need to ask for or obtain court orders or have patient sign release.
13. Sensory factors are factors with senses of the body, i.e. sight and hearing.
14. Vision impairment to a driver may take several different forms, to include acuity or sharpness of seeing.
15. Other forms include night and glare blindness, tunnel vision, depth perception and color blindness.
16. Hearing defects must always be looked into, mainly with pedestrian crashes.
17. Drivers with hearing defects may not hear a vehicle defect while driving or a horn.
18. Physical handicaps can include hand brakes, or gas pedals adapted to the vehicle.
19. The traffic investigator must look at all physical factors in the investigation.

20. If the driver is short, was the seat properly adjusted to reach the pedals?
21. If the driver has an arthritic condition and pain, did it hamper the ability to depress the brakes or a delay in depressing them?
22. Never jump to conclusions when dealing with the human element.
23. Just because a condition exists, it does not mean it contributed to the crash. We ALWAYS have to be certain!
24. Distractions often lead to a number of crashes.
 - a. Minor distractions -- insects in the vehicle, rocks or bugs hitting the windshield.
 - b. Common distractions -- passengers, pets, radio, cell phones and children.
 - c. Other distractions -- lighting cigarettes, opening or closing windows, reading a map or reaching into the glove compartment.
25. You will have to ask, people may not volunteer this information for fear of being ashamed of what they were doing or they know it was wrong.
26. REMEMBER: Every person on the roadway is an individual with specific characteristics and only through a detailed investigation and interview will it be determined if these conditions or factors played a part in the crash.

VIII. Interview Phase

- A. Interviewing means; looking for information.
- B. Your questions will prove facts, disprove statements or clarify statements.
- C. REMEMBER, the importance is how you make your approach to these people.
- D. Interviewing problems:
 1. Most interviews have insufficient information.

2. There is no systematic approach to obtain information.
 3. No prior training in interviewing techniques.
- E. Always start with general questions, then lead into specifics.
- F. Questions should be targeted at who your speaking with:
- Driver
 - Passenger
 - Independent witness
- G. When interviewing any driver, be cognizant of their rights during questioning.
- H. Routine crash questions do not require Miranda until questions focus on an arrest.
1. Juvenile Driver -- Right to have parents present (arrest)
 2. Adult Driver -- Possible Miranda warning
 3. Independent witness -- No Miranda needed
- I. REMEMBER: When talking with a person at a crash scene, they may be dealing with trauma.
1. You may get answers that don't make sense
 2. It is your job to make sense of the situation
- J. Be PREPARED before conducting the interview.
1. Know the dynamics and physical evidence at the crash scene.
 2. Your interview should be with the intent to complete the missing portions that the physical evidence doesn't explain.
- K. There are two types of information that can be obtained from an interview.
1. Investigative -- Will assist in explaining events or actions not determined through physical evidence
 2. Behavioral -- Individuals body language. Are they being deceptive in some way?

- J. Always separate your witnesses before interviewing. This will eliminate any influence they may have on each other's accounts of the crash.
1. This may not be possible with juveniles. Talk to parents and stress importance of talking separately.
- K. Do not conduct an interview with your own agenda in mind. Be unbiased and professional with every subject.
- L. Do not lead the interview or subject in any specific direction. Be prepared to change your analysis of the crash, you may have misinterpreted the physical evidence.
- M. Develop a plan and list of questions based on the dynamics and physical evidence of the crash.
- N. Conduct the interviews separately.
- O. Be a good listener.
- P. Maintain control of the interview.
- Q. Don't dispute or argue subjects answers.
- R. AGAIN, be flexible and be prepared to generate additional questions based on the subject's responses.
- S. Touch on all the human senses
- Smell
 - Hearing
 - Vision
 - Physical Feeling
- T. When interviewing any subject be aware of:
1. Physical condition
 2. Attitude toward the interview
 3. Relationship to any drivers or passengers
 4. An overall agenda, do they have anything to lose or gain from the interview or outcome of the investigation.
- U. Always plan your interview based on the following:

- Trip plan
- Pre-crash phase
- Crash phase
- Post-crash phase
- Vehicle, driver and causal factors

1. Trip Plan.

- Where were the drivers going?
- What was their schedule, and were they late?
- Purpose of the trip?
- Was the driver familiar with the route or area?
- Activities prior to trip:
 - o Work, sleep, eating, alcohol or medication taken.

2. Pre-Crash Phase

- What was the location of:
 - o Vehicles, individuals, directions of travel, lane of travel, distances or view obstructions
- Activities of the individuals
- Smoking, eating, talking, cell phone, radio or pets
- Other insight to distractions
- Were seat belts worn?
- Location of individuals
- Vehicle speeds and how determined
- Cruise control on or off?
- Time and distance from last stop during trip.
- What was drivers intention?
 - o Going straight, changing lanes, turning or stopping.
- Road conditions
 - o Traffic density, road conditions, traffic signs or lighting.
- Weather
- Rain, snow, fog or glare.
- When did the drivers first see each other?
- Vehicles position and speed
- What was drivers “thought” of the actions of the other driver at that time and their own?
- What evasive actions were taken?
 - o Brake, horn, steering or something else.

3. Crash Phase

- a. The impact only takes a fraction of a second.

- b. Most drivers will not have a clear grasp of what happened.
- c. Some people will black out or trauma will blank out that time.
- d. They will tell you what they think happened.
- e. You should have the answers to this phase.
- f. Your questions will help substantiate what you know or feel.
- g. Many of the same questions asked during pre-crash phase can be asked again for the crash phase.

4. Post-Crash Phase

- a. Occupant placement after the collision and how did they exit the vehicle.
- b. What kind of injuries, especially the ones that are not visible?
- c. Any injuries prior to the crash?
- d. Any flying objects that caused the injuries?
- e. Final rest of vehicles and if they were moved prior to your arrival.
- f. Who saw the crash, who reported it and who gave first aid prior to your arrival.
- g. Drivers familiarity with vehicle, length of ownership or how often they drive vehicle.
- h. Vehicle condition prior to the crash
 - 1). Brakes, steering, suspension, tires, recent repair and prior damage.
 - 2). Lights and wipers working properly.
- i. Driver conditions
 - 1). Color blind, driving experience, night blindness or restrictions.

- j. Driver young or old, formal driving training.
- k. Driver history, prior crashes or citations.
- l. Emotional state of driver prior to crash.
- m. Any casual factors
 - 1). View obstructions, reaching for something, tending to child or pet, or talking on phone.
 - 2). Ask to check phone call history and text messages. If suspected, take phone and get warrant
 - 3). Look for open documents that show the driver may have been reading
 - 4). Spilled coffee or pop.
 - 5). Music CD's on the floor
 - 6). Any other factors that may have led to distractions to driver.

5. Interview Summary

- a. The interview is an important source of information, they can prove or disprove statements involved in a crash.
- b. Start with general questions and become more focused as you go.
- c. NEVER suggest answers to your questions.
- d. Be sure to separate parties, do not tell others what was said until you have interviewed them.
- e. Do not allow confrontations between involved parties.
- f. Be patient and adaptable.
- g. Allow for nerves and shock to wear off.
- h. Be diplomatic and never take sides.

- i. Keep in mind that crashes are traumatic situations, show compassion, be reasonable and show understanding.

IX. Evidence Collection and Processing

A. Evidence Recognition

1. What is the question that needs to be answered?
2. What will provide that evidence value?
3. Where will you conduct the processing/collection?
4. Search warrant needs?
5. Team members assisting, photograph, forensic and mapping needs?
6. Chain of Custody

B. Evidence Management

1. Don't clean up the scene until you're done.
2. Speak to EMS/Fire prior to clean up.
3. DON'T GET IN THE VEHICLE! Contamination concerns
4. 5 evidence destroying considerations:
 - Weather
 - Friends/relatives of driver/passengers
 - On lookers, crowd or good Samaritans
 - EMS/Fire
 - Officers

C. Evidence Collection

1. Foot impressions around and in vehicle
2. Fingerprints
3. DNA
4. Biological
 - Trace

- Fibers
 - Fluids
5. Photograph before, during and after
 6. Lifting tape
 7. Containers -- Wet vs. dry items
 8. Swabs -- Control or sample swabs needed also
 9. Documents -- Handwriting, DNA and fingerprint

X. Photography

- A. Credibility of Photography Evidence -- keep in mind that a photograph may not be an exact representation of what was actually photographed. There may be a difference in color or lighting.
- B. Who should take photographs?
 1. Almost anyone can take photographs.
 2. Courts have ruled that photographer does not need to be an expert.
 3. The picture should accurately depict what you see and the image you're trying to capture.
 4. Your photographs should tell the story and support the details of your investigative report.
- C. When to take photographs?
 1. The scene should be photographed before any marking of the scene occurs in order to show the scene as it appeared upon your arrival.
 2. Photographs need to be taken as soon as possible after the short-lived evidence is located and measured.
 3. Photographs may be delayed for patient care or clearing of the roadway.
 4. Marks on the road may be obscured by debris, water, snow or other objects.

5. Certain evidence is short lived. If applicable have some initial photographs shot upon arrival to show conditions or evidence at that time.

D. What to photograph?

1. Depends upon:
 - The ability of the photographer
 - Equipment and supplies available
 - Urgent duties at the scene
 - Availability of others to assist
 - Weather conditions
 - Seriousness of the crash
2. Damage is photographed to help reconstruct the crash.
3. Contact and induced damage usually are better visualized by photographs.
4. Photographs should be used in conjunction with vehicle damage descriptions and measurements.
5. Take a close-up to match gouges to undercarriage damage if possible.
6. Take detailed photos of imprints, abrasion marks, lamp damage, load damage or sources of impact to pedestrians.
7. Take distance photographs and close-ups for detail.
8. Take distance shots of occupants ejected to show relationship to vehicles movement and final rest.
9. Photograph the following, when present.
 - Impact
 - Departure
 - Final rest
 - Roadway signs
 - Obstructions
 - Take photographs with each vehicle in the foreground and final position of bodies.
 - Detached parts of vehicles.
 - Offsets
 - Scrub marks
 - Striations in yaw marks
 - Pavement texture

- Tire prints
- Debris and rubbish from vehicles
- Gas and water puddles
- Gouges and scratch marks
- Oil and blood stains
- Ruts and Furrows
- Paint transfer and imprints
- Exterior Damage
- Interior Damage
- Victim's Injuries
- Roadway Photographs
 - o Non-changing items such as hills, curves
 - o Conditions of roadway
 - o Visibility factors
 - o Traffic Control devices
 - o Obstructions, signs or background items
 - o Relationship to roadway

E. Planning the photographs

1. Does the camera see what you want to see?
2. Change the camera location
3. Ask people to move
4. Move rescue or fire equipment
5. Take series of photograph
 - a. More informative than single
 - b. Start with general overall and move into what you want to show
6. Wide angle lens will capture the area
7. Vehicle tags and VIN for identification

F. Equipment

1. Digital SLR 35mm (Single Lens Reflex)
 - Eliminates developing costs
 - Memory cards reusable
 - Download instantly, view instantly
 - Do NOT alter original photograph files
 - o Save altered in a separate file

2. Point and Shoot Camera
 1. Cheaper, most new digital have many features that make them excellent for first responders and patrol officers
3. Cell phones, don't use your personal cell phone. This opens up the phone to full disclosure by the courts. (Evidence Apps now available)

G. Photograph Techniques

1. Night photographs
 - Most difficult to take
 - Use a flashlight to focus
 - Flash exposure
 - Paint the scene with flash
 - Use flood lights, fire department help
 - Time exposure with manual settings
2. Day photographs
 - Use lens shade or hold hand over camera to eliminate glare on pictures
 - Use flash to fill in light for dark or shaded areas
 - Capture sun angle if glare is suspected
3. Camera height
 - Set at driver's eye level
 - Set aperture at 50 mm (Eye level)
4. Camera position
 - Can show distance between objects
 - Can show visual obstructions

H. Identification of Photographs

1. Use a numbering system
2. Use a photographic log
3. Where taken
4. Date taken

5. Who took photographs
6. Case number and agency
7. Where are the originals kept
8. The photographer should be able to explain the pictures in detail:
 - Camera used
 - Was the print altered
 - Was a flash used
 - Manual time exposure and what settings
 - Lens type and settings
 - Check “properties” of photograph

I. Video Camera

1. Video does not replace photographs.
2. The advantage is that the video makes it hard to dispute what was taking place at that time and can be narrated.
3. Disadvantage is that unwelcome remarks can be heard. The camera records everything.
4. Body Cameras
5. Video Techniques
 - a). Don't zoom excessively
 - b). Put video in car and trace route of each car
 - c). Record your evidence in a walkthrough
 - d). Practice walking and recording to reduce bounce
 - e). Be sure to tell everyone on scene your recording.
 - f). Use same rules as photographs

J. Sequence your photographs

1. Start back and work forward
2. 90 degrees rear to front

3. Shoot profile pictures
4. Check and photograph the undercarriage
5. Take measurements to match damage

XI. PHYSICAL FACTS FROM THE ROAD

- A. Collecting and recording the physical evidence found at the scene of a crash is the single most important function conducted by the investigating officers. This will help:
 1. Determine factors contributing to the crash.
 2. Prove or disprove statements.
- B. Properly preserved, documented and interpreted, the physical evidence will make the difference between proving our conclusions as to the factors of the crash and making assertions based upon an incomplete investigation.
- C. Evidence from the roadway takes many forms. We categorize it in several broad areas which include debris, metal scars, tire marks and topological features: i.e. curves, grade and super-elevation, width and obstructions
- D. Environmental factors also need to be noted.
 - Dry or wet surface
 - Snow, fog, rain or ice
 - Nighttime or daytime
 - Artificial lighting
- E. The roadway surface must always be examined at the time of the investigation. Factors may be found relating to the roadway that contributed to the crash. The surface will also become important when working mathematical calculations for speed determination.
- F. Conditions that may have been proven to be a factor in the crash include:
 - Moisture
 - Ice and snow
 - Oil and grease
 - Soft asphalt, tar or pot holes
 - Loose surface materials
 - Conditions that may have been proven to be a factor in the crash include:

- o Change in roadway alignment or a sudden change in traffic flow.
- o Grade and super elevation
- o Lack of; or misplaced signage
- o Soft shoulders or drop off from driving lane.

G. Visibility Obstructions -- Visibility obstructions in or on the roadway may include:

- Parked or disabled vehicles
- Slow moving vehicles
- Pedestrians or objects obscuring the roadway, signs, buildings or foliage
- Glare -- Depending on time of day, glare can be a factor.
- Other lighting such as headlight glare or glare from a building can be a factor.

H. Debris

1. There are many forms of debris:

- a. It can be from the vehicle itself, such as fluids or dirt.
- b. It can come from cargo, such as grain being transported.
- c. It can come from objects struck, such as blood from a pedestrian.

2. The importance of debris is not that it will tell the precise area of impact, but rather an indication of an area of impact. This is due to debris spreading from narrow to wide after impact. This explains why debris can assist in determining direction of travel.

3. Types of Debris

a. Dirt:

- Scatters after impact. Gives area of impact.

b. Fluids:

- may tell direction of travel after impact
- may show final rest of vehicle.
- may indicate vehicle defects (brake fluid prior to impact)

1). Types of fluids:

- a). SPATTER: Any liquid from the vehicle or its cargo thrown forcibly on the road, other vehicles, or other objects.
(radiator in collision)
- b). DRIBBLE: A trail of dripping fluids from the vehicle or cargo that drops to the road. (leaking brake line)
- c). RUN-OFF: A dribble that that forms a puddle and flows or trickles to the edge of the road.
- d). PUDDLE: Concentrated area of fluid. Good indicator of final rest of vehicle, cargo, or other objects.

c. Cargo

- Cargo can assist in speed calculations.
- May indicate direction of travel.
- May show area of impact.

d. Parts

- Important in Hit & Run Accidents for vehicle identification.
- May show direction of travel.
- May assist in determining area of impact.

e. Glass

f. Metal Scars

1) Scratches

- Light pressure from sheet metal over surface.
- May indicate a vehicle roll-over. This can best be observed by looking at the sheet metal on the vehicle.
- May show direction of travel and maximum engagement.
- May assist in determining the number of times a vehicle has rolled.

2) Gouges

- Caused when a heavy structure digs into the pavement or ground and gouges out pieces of the road or ground.
- You may match vehicle parts to gouges on the road. This assists in vehicle placement at that particular place.
- May show direction of travel.
- May show maximum engagement.
- May show approach and/or departure angles of vehicles.

3) Chips

- Are small gouges.
- Often found in blacktop or edges of concrete.
- Often observed in the area of impact.

4) Chops

- Are shallow gouges.
- Axe type impressions.
- Wheel rims may make chop marks in the surface.
- May assist in determining maximum engagement.
- May assist in determining direction of travel.

5) Grooves

- Are long narrow gouges.
- Made by a strong protruding item from the vehicle such as ball joints, bolts, rim marks from rim with flat tire, etc.

I. TIRE MARKS

1. Can assist in showing perception and reaction points.
2. Show direction of travel.
3. Often show an area of impact (deviation of skidmarks).
4. Show location of vehicle on roadway.
5. Show evasive action of driver.

6. Lack of marks may indicate no evasive action or a malfunction of the vehicle.
7. Skid Marks
 - a. Made by a sliding non-rotating tire.
 - b. Parallel striations with the direction of travel.
 - c. Don't start immediately upon braking, why?
 - d. Start light in color and end dark, why?
 - e. Rear wheels usually lock-up first. This is caused because of weight shift of the vehicle.
 - f. Rear wheel skids have a dark center.
 - g. Front wheel skids have a dark outside edges.
 - h. Vehicles skid straight unless acted upon by an outside force such as gravity or collision with another vehicle.
 - i. Skid Marks end abruptly. Dirt build-up at the end of the skid.
 - j. A vehicle with front tire lockup only will skid in a straight line unless acted upon by an outside force such as a collision, gravity, etc.
 - k. A vehicle with rear tire lockup only will rotate 180 degrees if the vehicle has enough speed and there is no steering input.
8. Skip Skids
 - a. Usually caused by heavy suspended vehicles (tractor-trailer rigs).
 - b. Gaps between skids are 3 feet or less.
 - c. When measuring, measure as one entire skid.
 - d. May also be caused by rough road conditions or from striking an object on the road, such as a pedestrian.
9. Gap Skids

- a. Caused by braking, releasing the brake, and braking again.
 - b. Often occurs when a driver sees an animal such as a deer, locks up the brakes, releases as deer moves off roadway and another deer appears, lock up again.
 - c. Gaps between skids are 10 feet or more.
 - d. Measure skid lengths separately.
10. Yaw Marks
- a. Made by a rotating sliding tire.
 - b. Non-parallel striation to the direction of travel.
 - c. Curved in appearance.
 - d. Striations are the most distinguishing factor.
 - e. Can get an average speed estimate from a "Yaw Mark" You need a cord, middle ordinate, and drag factor of the road.
 - f. Yaw marks are usually caused by steering. Vehicle will rotate around its center of mass, and often times
11. Tire Prints
- a. Are made by a rotating tire.
 - b. Oftentimes displays a tread pattern.
 - c. Often observed on wet roads or roads with loose material.
 - d. Tire Prints on wet road will often show a direction of travel.
 - e. Possible vehicle identification based on tread pattern of tire.
12. Squeegee Marks"
- a. Made by water being wiped off the road surface.

- b. These marks are very temporary and may be gone shortly after the road dries.
- c. These type of marks are useful for vehicle placement on the road at a particular point.

13. Furrow

- a. Plowed depression from caused by a sliding tire.
- b. In loose dirt or snow.

14. Scrub Marks

- a. Caused by a slight sideways movement during contact with another vehicle.
- b. Will show area of impact.

15. Acceleration Marks

- a. Parallel Striations.
- b. Start Dark And End Light.
- c. Make Not Be Straight.
- d. May Have Scalloped Start.

16. Flat Tire Marks

- a. Flat tire marks may have dark outside edges.
- b. Snake like in appearance.

J. Physical Facts From the Roadway (Summary):

- 1. Provide a wealth of information about the accident.
- 2. You must preserve this type of evidence at the scene.
- 3. Photograph and record physical facts from the roadway as soon as possible.
- 4. The scene can change fast!!

XII. PHYSICAL FACTS FROM THE VEHICLE

A. Vehicle Description and ID

1. General Description
 - Type
 - Body type
 - Model
2. Structure and application
 - Size
 - Use and service
3. Specific Description
 - Wheelbase
 - Weight
 - Modification

B. Vehicle Inspections

1. The crash scene vehicle should be inspected as soon as possible and include:
 - Overall condition
 - Final rest location
 - Photographs of all vehicles
2. If necessary, a detailed inspection should be done by a trained mechanic.

C. Vehicle Defects

1. A vehicle may contribute to a crash if a defective part interferes with its operation.
2. Vehicle Defects are hard to prove. You need to know if the condition existed before the crash.
3. We must also know if a vehicle defect contributed to the crash. *An example would be not brake lights in a rear end collision.*
4. Document claims made by drivers of vehicle malfunctions.

5. Ask questions about vehicle defects. Note answers and comments.
6. Note if the driver complained of a vehicle defect.
7. Note if passengers warned the driver about defects.
8. Did the driver have difficulty controlling the vehicle?
9. Ask if anyone heard or saw anything that may have indicated a problem with the vehicle.

D. Parts on a Vehicle to Check

1. Tires

- a. Tires are blamed for more accidents than they cause.
- b. Look for pre-impact marks left by flat tires (snake like mark).
- c. Often times a bead breaks on a rollover, and the driver claims the tire blew out. The tire did not contribute to the accident in this circumstance.
- d. Examine for an "X" on the inside of the tire. Or air up a flat tire. If there is an "X" inside the tire, it indicates the tire did in fact blow.
- e. Only a ½ to 1 percent of tire failures lead to a traffic collision.

2. Wheels

- a. Very rarely contribute to an accident.
- b. You should look for metal scars on the roadway.
- c. A wheel may break during a "yaw", but driver error may be the contributing factor to the wheel breaking.

3. Springs, Shocks, Suspension, & Steering

- a. Very rarely contribute to an accident.
- b. Check for metal scars on the roadway.
- c. Look for broken springs and shackles.

- d. Check the amount of play in the steering wheel.

4. Brakes

- a. Brakes are the most common of vehicle defects, but are still rare in occurrences.
- b. In checking for brake failure, look for brake fluid or lack of fluid. Also, look for cracked or broken brake lines.
- c. Ask the driver if the brakes grabbed or locked.
- d. Improperly adjusted brakes may cause the vehicle to swerve or pull.
- e. If a vehicle is overloaded, especially trucks, it will reduce braking efficiency of the vehicle.
- f. Check the Brake Fluid Level
- g. Check for leaks in brakes, these are dry.

5. Accelerator

- a. Examine the linkage and check the return spring (especially in HOT RODS).
- b. Look for acceleration scuffs.
- c. Most of the time driver error rather than a faulty accelerator causes an accident.
- d. Check to see if a floor mat interferes with the accelerator or the brake pedal.

6. Latches & Restraints

- a. Check hood and door latches (this can be difficult to do in some cases because of damage).
- b. Check restraints: sometimes you can determine occupant placement by the injuries sustained.
- c. If no restraints were used, may have that fact caused the driver to lose control during a particular maneuver?

7. Windows & Glass

- a. If a windshield was shattered before an accident, may have the vision been obscured from sunlight or headlights.
- b. Look for failure to scrape frost from the windshield. Often times people don't see well because they only have a small portion of the windshield free of frost.
- c. To see if a windshield was scraped properly, look for dried dirt on the glass. Often times the defroster will have the frost melted by the time law enforcement arrives.

8. Lights

- a. This is the most common defect claimed by people.
- b. Do not check lights yourself. If there is a question as to whether a light was on or not, remove the light assembly and send it to the State Lab for a forensic examination.
- c. Photograph the lights in place prior to removing them for shipment to the lab.
- d. Have owner permission to remove lights or any other parts from a vehicle, or get a search warrant.

9. Horn

- a. Check the horn on a vehicle in pedestrian related accidents.
- b. In this case, you may check the horn yourself to see if it is working.
- c. If a pedestrian accident, after checking the horn also check to make sure the pedestrian was free of hearing defects.

10. Mirrors

- a. Sit in the driver's seat and check for blind spots.
- b. On oversized vehicles or vehicles pulling trailers, campers, boats, etc. check to see if the mirrors were

adjusted properly to see beyond the sides of the towed vehicle.

- c. See that there are adequate mirrors to see to the rear of the vehicle.

11. Passengers

- a. Check for overcrowding which may cause driver interference.
- b. Were there too many passengers which prevented the driver from maneuvering the vehicle properly?
- c. Did the passengers interfere with the driver's vision?
- d. Did a passenger attempt to turn the wheel or hit the brakes or step on the accelerator?

12. Cargo

- a. Did cargo obstruct the driver's vision?
- b. Was there improper loading of cargo which contributed to the accident?
- c. Did the cargo shift causing loss of control or loss of the load?
- d. Was the cargo properly secured?

13. Windshield Wipers

- a. Check to see if they were operable and in good condition.
- b. Check the position of the switch if the windshield wipers should have been on.

14. Drive Train

- a. Check for engine or transmission failure.
- b. Did a drive-shaft break and cause an accident?
- c. Drive-train related accidents are rare, but possible.

15. Instrument Panel

- a. Look at the instrument panel for clues.
- b. Inspect the position of the light switch.
- c. Inspect the volume of the radio.
- d. Inspect the instrument gauges.
- e. Inspect the speedometer; sometimes this can give you a good indication of speed at the time of the crash.

E. Types of Damage

1. Contact Damage

- a. Damage resulting from direct contact between objects. *Internal & External*
- b. Heavy damage area.
- c. An example of internal would be a head contact into a windshield.

2. Induced Damage

- a. Stress damage as a result of contact damage.
- b. It is the twisting and buckling of metal and plastic.
- c. An example would be stress lines across a windshield.

3. Super-Imposed Damage

- a. This is observed normally within the contact damage area.
- b. Protrusion from one vehicle imposed into another. An example of this would be the ability to see the outline of a bumper in the side of a vehicle.
- c. Examples would be: bumpers, grill-guards, license plates, vehicle emblems.

4. Secondary Contact Damage

- a. Definition – multiple contact damage areas resulting from one collision.
- b. Most common collisions resulting in secondary contact damage are intersection collisions.

5. Rub-Offs

- a. Material from one vehicle transferred to another vehicle or onto the pavement.
- b. Examples: paint transfer, rubber transfer.

6. Rollover Striations

- a. Striations imposed into the sheet metal or body paint of a vehicle.
- b. Look at the different number of striation angles, this can give an indication on the number of times a vehicle rolled.

F. Review -- Physical Facts from the Vehicle

- Inspect the vehicle as soon as possible after the accident.
- Photograph and record any defects.
- Document all defects claimed.
- Save damaged or defective parts if possible.
- Listen to occupants to see if they indicate any type of defect.
- Don't overlook anything.
- Take enforcement action when a violation is discovered.
- Look for improper maintenance and see if it was negligent.
- An improperly equipped or adjusted vehicle is a violation of SDCL 32-21-27.